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COOP'S TECHNOLOGY DIGEST

-A Timely Report On The *World* Of Communications-

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IS THIS A SERIOUS EFFORT?

BCL's WHITBY TESTS OF CABLE TV

Do As I Say ... Not As I Do

CTD for May 1994 (9405: p.26) reported that BCL's one-year-in-planning 'cable TV trial' in the Whitby suburb of Wellington was functional. The Broadcast Communications Limited entry into 'traditional cable television service' comes at a time when other major players are aligning themselves to be an active part of the "interactive information superhighway" which pundits are now forecasting for New Zealand (and the world).

Telecom (New Zealand) began its own "cable TV trials" last November (CTD: 9309, p.2; 9311, p.30; 9401, p.31) with fibre "to the block" and traditional coaxial cable to the home in segments of Auckland suburbs Pakuranga and New Lynn. Telecom's *Jeff Carter*, overseeing the fibre optic/coaxial trials, has suggested the trial area **(a)** will expand to new Auckland districts (but does not suggest where, or when), **(b)** will increase its present channel/programme offerings by entering into 'partnerships' with information 'providers' (who, as a category, are now being called 'servers') and is actively soliciting interested parties to bring 'server projects' to Telecom.

BCL characterises their Whitby suburban 'trial' as being "*totally different than the Telecom trials*" and nobody associated with BCL will admit the firm has any plans to do more than provide "*traditional master antenna service to disadvantaged homes.*" Whereas Telecom readily admits it is trialling fibre optic (cable TV) for the purpose of exploring entry into the "information superhighway" era coming, BCL won't at this point even discuss the possibility that systems such as Whitby might offer "enhanced TV service" by "plugging in satellite delivered programming." To reinforce the 'traditional, master antenna service' concept which BCL claims to be pursuing, the firm's **Chris Wanden** has written letters (**The Listener:** June 04, 1994) and granted interviews (**InfoTech Weekly:** June 13, 1994) in which he clearly states:

"*The homes are not receiving any new material* (i.e., no services not otherwise available to more fortunately situated Wellington TV homes) *and we are not testing any new technologies or services.*"

Telecom is very inquisitive about the BCL trials and is not willing to accept Wanden's statements at face value. 'Traditional cable TV,' the kind that BCL is trialling in Whitby, is no different technically than American (Canadian, European, etc.) 'traditional cable.' As Jeff Carter has recently stated:

"*A lot of cable television companies are already saying* 'all we have to do is put a switch on this equipment and we can offer telephone service as well,' *and telephone companies are saying* 'we only have to put video-type equipment on our system and we have pay television,' *and they are quite right.*"

As we also related in September (CTD: 9309, p.12) Carter sees little choice but to move ahead with television in the Telecom plant:

"*Telecom is ensuring its core businesses are protected from any newcomers who get established in cable television first.*"

Ltd (then 33%), The Alternate Telecommunications Company Ltd (then 25%) and a stake holding in (the) NZ Listener (1990) Ltd (15%).

In 1990 the TVNZ Planning Department created a study ("New Zealand and the International Television Industry") which received limited circulation within TVNZ and certain government circles. The document has been described as a 'business plan for Television New Zealand through the year 2000.' This study related the status of television broadcasting world-wide (1990) and forecast that under the 1988 deregulation, TVNZ and indeed New Zealand television viewers were likely to experience an influx of 15 to 30 "*foreign television programme channels dominated by large, multinational companies.*" The study warned readers "*it* (is) *mandatory to reposition and revitalise the company* (TVNZ) *after 30-years of monopoly* (or) ... *run the risk of being marginalised.*"

Translation? TVNZ had to join the 21st century telecommunications revolution, or, be run over by it.

Page nineteen of this document stated:

"*The outstanding issue is - will New Zealand television become marginalised and lose its unique identity?*"

The document then forecast "*a dozen or more channels in New Zealand's larger cities, resulting in each channel having a small audience share* (and, revenues and profits decline)." In listing options available, it suggested:

"*Re-regulate to prevent foreign cable companies and satellite transmissions from entering New Zealand and limit the number of channels so all are profitable.*" The report concluded this was not a viable option and suggested, "*Consequently, Australian satellite channels, cable operators and telecommunications companies are all potential competitors.*"

To that scenario it suggested a more positive option:

"*New Zealand broadcasters* (meaning TVNZ and its affiliated companies) *move into Pay-TV and satellite services to pre-empt foreign penetration of the local market. This would protect* (the TVNZ) *revenue base and provide funds for local programming.*"

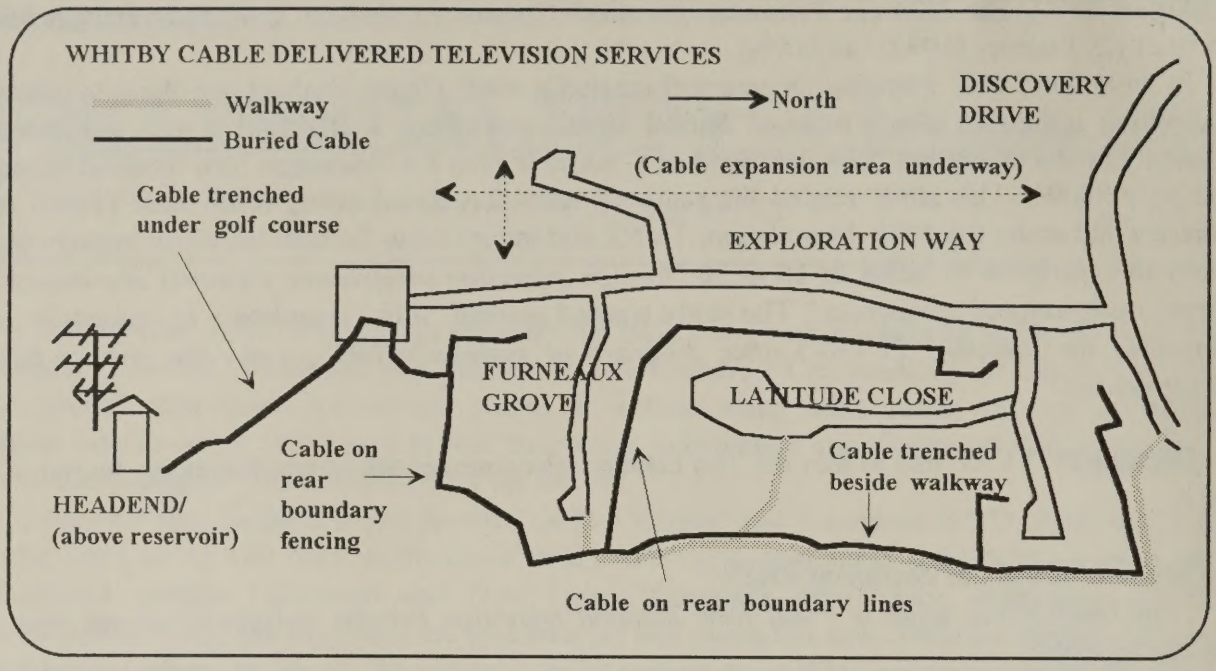
It further suggested:

"(That) *New Zealand broadcasters own outright or have influential interest in telecommunication delivery systems including satellites and/or* (fibre optic) *cables. (If these are owned by foreigners or non-television interests, then New Zealand television broadcasters will not control their own destiny.)*"

TVNZ's financial stake in Sky Network (currently 16.3%) partially satisfies the 1990 objective of holding an influential interest in "telecommunication delivery systems." TVNZ's $10m (25%) investment interest in Clear Communications new fibre optic 'ring' around North Island (CTD: 9403;p.16) further strengthens that position. BCL's recent investment in the Whitby 'traditional, analogue cable service' is viewed by at least some in Telecom as a further indication of their intent to implement the game plan first proposed in 1990.

THE BCL WHITBY SYSTEM

A reader interested in how cable systems are designed and how their costs are computed is referenced to **Tech Bulletin**. The Whitby system, if duplicated over the same ground by someone other than BCL, should cost no more than NZ$56,700. With some cost effective rearranging, it



BCL Whitby system has selected cable-quality headend equipment but relied on master antenna cable layout and installation techniques to reach initial 90 homes offered service through mid-June. Normal utility easement areas would parallel streets adjacent to paved area.

could be built for NZ$37,670. Putting that in terms of houses 'passed' (in cable speak, a home 'passed' is a home which the cable company can efficiently serve once the cable lines are in place), 89 homes passed at NZ$56,700 comes to $637.08 per home invested capital. At $37,670 we have $423.26 per home invested capital.

BCL wrote letters to the prospective 89 home owners. A letter dated 24 September (1993) said:

"We will install a community antenna at an appropriate site that will receive all of the television services from our transmitters...You will never have to worry about television reception again!"

Meetings were held in the neighbourhood between BCL and residents on September 24 and again on October 3. On October 20 (1993) a new letter included an agreement to be signed by the residents ("Consent to Install and Maintain Cable"), an "Agreement to Take Cable Delivered Television Service," and an explanation of how each home would be connected to the cable system (with "typical house installation diagram;" shown here).

A follow up letter October 21 reminded residents of the need to return the forms. Correctly assuming not all of the residents would subscribe, the October 20th letter had urged, *"The most important form to return right now is the 'Consent to Install and Maintain Cable'. Even if you don't want to receive the service right now the prompt return of this Consent will enable the Common Cable Distribution system to proceed."*

BCL approached this project in a unique way. Although BCL holds Network Operator status, which grants them the right to bury their cables within the 'utility easements', BCL elected to route the master cable on boundary fences within the residential area. This meant BCL had to obtain the written permission of each land owner to cross their property (and attach to the base of their fences: "Consent to Install and Maintain Cable"). Where fences did not exist, BCL elected to

for cable distribution. The signals remain encoded at this point. What happens next, if the BCL subscriber also wishes normal SKY service, is instructive about the corporate mindset now going into 'pay television trials' in New Zealand.

1) SKY and BCL have agreed that BCL is a contractual agent for SKY services;

2) BCL 'markets' (sells) the SKY services to their cable subscribers;

3) When a home orders SKY, even if the cable subscriber accidentally orders it directly from SKY, the installation person comes from BCL;

4) SKY treats BCL as an 'installation contractor' for its decoders with BCL assuming the added responsibility of marketing, billing and 'managing' the subscriber. For this value-added service, SKY discounts the normal retail price for its service 20% to BCL; at $9.99 per week / $42.96 per month, BCL can realise $8.59 per subscriber home for their part. For SKY it is a win-win situation; by using BCL cable customers they avoid the cost and hassle of installing UHF receiving aerials on customer homes (in an area where antennas fail to perform anyhow), avoid sending a service/installation truck to the customer, avoid having to chase the customer for bad debt or decoder retrieval. BCL agrees to do all of this for $8.59 per month.

SKY has a similar 20% arrangement with Telecom in the Pakuranga and New Lynn fibre optic test areas. But there is a significant difference. There, Telecom customers can order one of the three SKY channels (or two other pay service channels) for $3.99 (per channel) for 24 hours, or all three SKY channels for $9.99 per week (or three SKY plus CNN and ESPN direct satellite feeds for $10.99 per week).

In the BCL system an order for SKY requires that BCL roll an installation truck to the customer. However, at Telecom once the home has been connected to the fibre optic / coaxial cable hybrid system, the subscriber orders individual channels for individual days, or weeks, or the full month, through their telephone connection.

THE BCL RESPONSIBILITY

A BCL team led by Russell Lowther started on the project almost precisely one year ago. Lowther urged the project on the company and gathered material by attending a Florida (USA)

WHITBY CABLE GROSS RECEIPTS

When system is before 210 homes (see text) it should have 105 first-year subscribers (*). Modest 5% subscriber growth per year to 80% (**) in year 8 produces the receipts shown here.

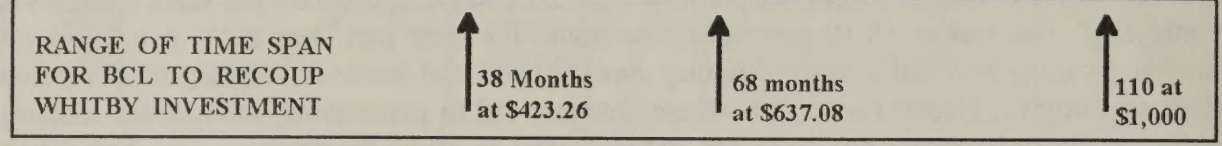
YEAR	Number Subscribers	Annual Sub Income	Total Sub Income	Initial Hook up Income	Total All Income	Cumulative Income
Year 1	105 (*)	$96	$10,080	$15,750	$25,830	
Year 2	115	$96	$11,040	$2,000	$13,040	$38,870
Year 3	126	$96	$12,096	$2,200	$14,296	$53,166
Year 4	136	$96	$13,056	$2,000	$15,056	$68,222
Year 5	147	$96	$14,112	$2,200	$16,312	$84,534
Year 6	157	$96	$15,072	$2,000	$17,072	$101,606
Year 7	168	$96	$16,128	$2,200	$18,328	$119,934
Year 8	168 (**)	$96	$16,128	-0-	$16,128	$136,062
Year 9	168	$96	$16,128	-0-	$16,128	$152,190
Year 10	168	$96	$16,128	-0-	$16,128	$168,318

-HOW LONG BEFORE BCL RECOUPS CABLE SYSTEM CAPITAL COSTS?-

BCL's Wanden told a Wellington newspaper (June 14 Evening Post) "(the Whitby) service is not being run on a commercial basis as it is costing BCL between $1,000 and $2,000 for each house it runs cable past."

A CTD laid-out cable system using the Whitby region described here has a top-end cost of $637.08 per home for the first 90 homes, a cost of $423.26 per home for all 210 homes in the area. When will the system return its invested cost (exclusive of what should be insignificant operating expenses)? We suggest it will require between 38 and 68 months.

YEAR	1	2	3	4	5	6	7	8	9	10
$$ PER SUB.	$216	$312	$408	$504	$600	$696	$792	$888	$984	$1,080



'wireless cable' trade show and then visiting and inspecting rural small community cable systems in Florida and Pennsylvania.

BCL employee John Burrows, a resident of the Whitby area, was appointed Project Co-ordinator before the serious construction began in December (1993). Burrows is a neighbour to most of the residents and he 'walked through' the individual house-by-house 'common cable routing' that ultimately became a time consuming activity for BCL management . When the system was finally past the hurdle of Consent Agreements a subcontractor chosen from the bid process did the trenching required and laid the cables along fence and property boundaries. At this point the cables (including house drops) were in place and BCL could proceed with installation of its antenna site equipment and plant electronics. A second subcontractor was brought in for the in-house wiring, and tuning of customer VCRs and TV sets.

The system has a maintenance contract with a Wellington division of the firm and customers are promised, "*Restoration of service within 4 hours for 95% of all service calls.*" Service calls will be not be charged if the system is at fault; the customer is charged if the fault is with their equipment or when the customer has damaged the drop line.

WHAT WHITBY CABLE CUSTOMERS AGREE TO - TO RECEIVE CABLE

Before BCL could build the Whitby system, and before a subscriber could be connected, they had to sign a "Consent to Install and Maintain Cable" agreement in which they agreed to:

1) Have cable housed in conduit of approximately 40mm in diameter fastened to (their) boundary fence or buried along or close to (their) boundary;

2) To allow a distribution box of approximate dimensions 200 x 300 x 170 mm to be fastened to or near (their) boundary (fence);

3) To allow subscriber drop cables to neighbours to be reticulated from the distribution box (across their property/lawns/gardens);

4) To use best endeavours to ensure the cable, conduit, fittings and electronics come to no harm;

5) To make no claim against BCL or its contractors for any losses;

6) To assist BCL in installing and maintaining the service to themselves or their neighbours by permitting access to their property

7) To not rescind the agreement for as long as the cable is on their property.

A HINT ABOUT ...

THE TV3 EXPANSION 'CHALLENGE'

Will Co-Channel Interference Ruin The TV3 'Image'?

Readers are reminded of a statement appearing on page 5 of CTD for January (issue 9401). At a Television Coverage Seminar hosted by New Zealand On Air (Wellington: November 9, 1993) Hugh Railton (Manager of Engineering Services, Communications Division, Ministry of Commerce) explained to the assembled group:

"*The 11 VHF channels available for TV1, TV2 and TV3 ... are insufficient in number if TV1, TV2 and TV3 all seek 100% population coverage as an objective.*"

Readers are further reminded of the joint announcement of April 28 (1994) from New Zealand On Air and Television 3 (CTD:9405; p.28) in which a further 61 TV3 transmission sites were identified for the 'final expansion of TV3' into rural New Zealand. The goal, the announcements claimed, was to make TV3 programming available to "*96% of New Zealand's potential TV viewers*" and for the final 4%, NZOA and TV3 outlined a 'self-help' programme that will allow community groups to raise partial funding for a TV3 (translator) transmitter, with NZOA picking up as much as $100 per new home served to complete the funding.

PLAN 3-C

The expansion of TV3 coverage was worked out in August of 1989; something known as "*Plan 3-C.*" This engineering plan was created to allow TV3 to shoe horn in new transmission channels in areas of New Zealand where TV3 expansion was likely but where TV1 and TV2 already were in operation. The architects for the plan were primarily at BCL since at the time only they had the experience and expertise to deal with this complex problem. You can read into that statement that 'Plan 3-C' had at least the tacit approval of TVNZ engineering as well.

Television channels are assigned to a particular location or site after engineering planners determine how the new transmitter is likely to interfere with existing or other planned transmitters. As Hugh Railton pointed out, we have 11 VHF channels to work with. And because each VHF channel can be used with either horizontal polarisation, or, vertical polarisation, this adds approximately 50% to the useful spectrum space. In other words, 11 channels with a single polarisation become 11 times 1.5 or 17 channels with two polarisations. In Railton's view, to enable three national networks to provide equivalent services to all New Zealanders would require not fewer than 12 VHF television channels (CTD:9401, p. 5).

The New Zealand television coverage problem is further complicated when and where people cluster along the coastal lines buried in terrain disadvantaged valleys. One of the worst scenarios for television coverage exists in the Northland region, from Whangarei to the top of Cape Reinga. In this portion of North Island, mountain ridges in the island centre provide convenient elevated sites for wide area coverage (Horokaka, Hikurangi, Maungataniwha) but each fails to reach into the relatively nearby (typically under 50km) coastal communities that exist at sea-level and behind signal blocking terrain.

Our system requires wide area coverage transmitters to serve as 'master stations' and they feed programming through direct off-air pickup to lower power repeater stations (known as translators). A wide area coverage transmitter (such as Hikurangi) is capable of reaching out to distances in excess of 100km if the terrain is relatively flat in all directions. But in Northland a series of mountain ridges intervene which in the worst cases reduces the effective range to under 30km. To 'fill-in' behind these intervening terrain obstructions, translators rebroadcast the wide area coverage service into valleys where direct reception is blocked from the wide area coverage transmitters.

Stations operating on the same channel must be separated by a distance that guarantees viewers will not receive two same-channel (known as co-channel) signals at the same time. This separation distance is sensitive to **(a)** the power of each transmitter, **(b)** the directional (transmission) antenna pattern of the transmitters, **(c)** the height of the transmitting antennas (greater transmitting height equals greater distances between stations on the same channel), and, **(d)** the intervening terrain (a mountain or hill will block reception and allow stations to operate on the same channel closer together).

New Zealand follows 'standards' in this field written and proven in Europe. They begin with mathematical formulae to approximate distance between co-channel stations, then switch to Survey and Land (Department) 'Topomaps' to pinpoint terrain profiles that will enhance or reduce the interference levels. Up to this point the study is conducted only on paper augmented with computer programmes that create interference profiles. In the final step an engineer may travel to the area in question and conduct a 'site survey' which verifies that the actual area is as envisioned from the paper study.

Interference between stations (on the same channel or on adjacent channels) has until recently been a 'closed-shop' matter; with only TV1 and TV2 operating, solutions (if warranted) were handled by BCL within the TVNZ frame work. When TV3 is added to the mix, competitive juices flow and BCL engineers must now defend themselves against TV3 engineers. Each is interested solely in establishing the largest interference free coverage zones possible for the home team.

Into this, the still pending VHF Management Rights (sale of channels) to TVNZ and TV3 Network creates a new hurdle. Ideally, engineers equipped with the best information and skills available would establish 'coverage zones' around transmission sites based upon the factors of transmission height, transmission power, and terrain shielding. As a practical matter, with 1.1 million TV receiving homes and more than 1,000 VHF TV transmission sites, a truly accurate appraisal of coverage versus interference is impossible. The exact location of every home in the country, plotted on computer mapping profiles against every transmitter site in the country would be a very ambitious project indeed. So under the VHF Management Rights programme there is a compromise: For each VHF transmitter site there are/will be ten (10) receiving sites specified where the level of interference to that site from all other sites will be 'certified.' The TV networks, when acquiring twenty year rights to the VHF channels, will have the legal right to challenge their interference-free coverage 'purchases' at only these ten sites per transmitter. If Auckland transmitters reach 300,000 homes (for example), under the VHF Management Rights programme they will be 'purchasing' guaranteed interference free coverage at only 0.0000333% of those homes. In the Auckland example, the 'other' 299,990 homes in their paper coverage area could be riddled with interference and they will be without legal recourse to the Crown.

Each new TV transmitter installed with the TV3 expansion further complicates the interference scenario. Some of the interference problems are obvious, even to the uninitiated. For example, when the primary transmitter at Maungataniwha is activated (see table here; November 1994 schedule) on channel 4V (for vertical) all other existing transmitters using channel 4V within a

FAR NORTH REGION/ NORTH ISLAND

Using Plan 3-C as a basis, the consumer's TV antenna marketplace ahead.

SITE NAME	TARG. DATE	NEW VIEW.	TV1 CH.	TV2 CH.	PLAN 3 C/ TV3	1994 TV3	3C Viewer Antenna Changes
Hikur-angi	Oct.94	21,951	3H	1H	10H	10H	Add new band III antenna
KerKeri	Nov.94	3,657	3H*	1H*	NONE	?	Unknown/ add band III likely
Maunga taniwha	Nov.94	14,346	6V	8V	4V	4V	Existing antenna OK
Ahipara	Dec.94	1,420	**4H**	10H	NONE	?	Unknown
Mango nui	Dec.94	1,205	**4V**	2V	9V	?	4V moves to 11V; existing antenna OK
Kawa Kawa	4th Qtr 95	1,946	3H*	1H*	NONE	?	Unknown
Maunha whai Hds	4th Qtr 95	764	6V	8V	10V	?	Existing antenna OK
Ngun guru	Dec.94	1,073	8V	6V	NONE	?	Unknown

*/ KeriKeri (3,657 people) and KawaKawa (1,946 people) are presently served by Hikurangi transmitter site of TV1, TV2; TV3 has elected to install additional transmitters for these two communities for TV3 as well.
4H/4V indicates present channel must change before TV3 service is added.

minimum of 100km must be moved to a new channel.; in some instances because of the 'reach' from the Maungataniwha 567 metre site present users of 4V much further away must be re-channelled. And, channel 4H (for horizontal) transmitters must also be moved, although because of the isolation between horizontal and vertical signals, in most cases stations can continue to operate on 4H as long as they are at least 100km 'out' from the Maungataniwha transmitter.

Each new channelling in turn has a ripple effect on other transmitters already operating. Say you move Mangonui's present channel 4V, because of Maungataniwha, to 11V. Then because Mangonui is a part of the TV3 expansion, a new channel must be found for TV3 at Mangonui as well. You start with 2V and 4V and end up with 2V, 9V and 11V in the community. The new transmitters on 9V and 11V must in turn be 'protected' from interference on these two new channels which means any existing 9V and 11V transmitters in the vicinity (within 50km since these are 'secondary' translators operating at far lower power) must also be rechannelled. The ripple effect can continue on for several 'chapters.'

TV3, in establishing new coverage, must co-ordinate the following: **(a)** the timely rechannelling of all effected transmitters before the new transmitter can be turned on; **(b)** the delivery of the new transmitter unit (from the French supplier); **(c)** the installation of the new transmitter/antenna; **(d)** providing of a quality 'input signal' to the new transmitter.

NORTH ISLAND / WAIKATO and COROMANDEL AREAS

Using Plan 3-C as a basis, consumer antenna marketplace ahead.

SITE NAME	TARG. DATE	NEW VIEW.	TV1 CH.	TV2 CH.	PLAN 3C/ TV3	1994 TV3	3C Viewer Antenna Changes
Maunga tawhiri	Dec.94	3,394	6H	8H	10H	?	Existing antenna OK
Tiarua	Dec.94	1,510	5V	11V	NONE	?	Unknown
Whanga mata	Dec.94	3,343	4V	10V	NONE	?	Unknown
Huntly	2nd Q 95	7,991	6V	8V	NONE	?	Unknown
Raglan/ **A**	2nd Q 95	3,009	1V	3V	NONE	?	Add new band III antenna
Tauma runui	2nd Q 95	7,952	7H	4H	2H	?	Add new band I antenna
Waihi/**B**	2nd Q 95	5,695	1V	3V	NONE	?	Add new band III antenna
Miranda /**C**	4th Q 95	1,533	1V	3V	NONE	?	Add new band III antenna
Corom. Harbour	4th Q 95	729	6V	8V	10V	?	Existing antenna OK
Manga kino	1st Q 96	1,746	6V	8V	NONE	?	Unknown

a/ Community mis-identified as Ragian in original NZOA/TV3 release.
b/ Northern Bay of Plenty region, served TV1 and TV2 from Te Aroha but blocked from TV3 RuRu
c/ SW corner Firth of Thames, served TV1 and TV2 from Te Aroha but blocked from TV3 RuRu

TV3 depends upon TVNZ subsidiary BCL to first agree to the new rechannelling proposed, and then to do the rechannelling. Many existing transmitters can be rechannelled within a band (i.e., move from channel 1 to channel 3, or, channel 4 to channel 11) but seldom can this work be done 'on-site'. Since it is not practical to go to a site, retrieve the old transmitter, take it to a BCL Lab in Wellington or Auckland for rechannelling, and then return the transmitter to the site on the new channel - viewers would lose TV service for that full period - typically a spare transmitter is prepared on the new channel and BCL personnel go to the site to pull out the old unit and replace it with a new one. The old one then goes back to the BCL Lab where it is retrofitted for the channelling required for the next site to be converted. Additionally, at each site the transmission antenna may also require replacement since a transmit antenna for 4V will seldom function properly on 9V without modification.

Sixty-one new transmitters for TV3 may actually involve nearly 50 transmitter change-outs as well. As expensive and time consuming as this is for TV3, the impact on the viewer is not insignificant.

NORTH ISLAND / MIDDLE, SOUTHERN, HAWKE BAY

Using Plan 3-C as a basis, consumer antenna decisions ahead.

SITE NAME	TARG. DATE	NEW VIEW.	TV1 CH.	TV2 CH.	PLAN 3C/TV3	1994 TV3	3C Viewer Antenna Changes
Wark worth	2nd Q 95	2,231	6H	8H	10H	?	Existing Antenna OK
Onetangi	4th Q 94	793	6H	8H	10H	?	Existing Antenna OK
Helens ville	1st Q 96	1,847	2H (Aklnd)	6H	10H	?	Possible new band III
Ohope	4th Q 95	1,077	4H	10H	NONE	?	Unknown
Waimana	1st Q 96	870	4H	10H	NONE	?	Unknown
Wairoa/ **A**	3rd Q 95	6,219	1H	3H	NONE	?	Add new band III antenna
Kairunga Hawke Bay/**B**	1st Q 96	1,191	?	?	NONE	?	Unknown
Mahoe	3rd Q 95	2,685	9V	11V	1V	?	Add new band I antenna
Opunake	3rd Q 95	2,787	5V	3V	UHF	?	Add new UHF antenna
Poutoko	3rd Q 95	1,752	4V	2V	?	?	Existing antenna OK?
Pukeiti	3rd Q 95	3,048	7H	9H	NONE	?	Unknown
Raetihi	2nd Q 95	1,197	3H	11H	4H	?	Existing antenna OK?
Taihape	2nd Q 95	2,079	6H	8H	10H	?	Existing antenna OK
Waiouru	2nd Q 95	2,328	11V	9V	1V	?	Add new band I antenna
Popoiti /**C**	4thQ 95	15,587	?	?	NONE	?	Unknown

a/ North end Hawke Bay, TV1 and TV2 service via Whakapunake
b/ Site not listed in Heinemann New Zealand Atlas; 1990 edition.
c/ Hill (419m) south of Masterton, east/southeast of Greydown at 41.09S, 175.34E

As an example, consider the tiny far north community of Te Kao. Presently it is served with three watt relays of Maungataniwha channels 6V and 8V on Te Kao 4V and 10V. With the activation of 4V on Maungataniwha Te, Kao's channel 4 (TV1) will move to channel 2V. Te Kao is below the cut-off for TV3 so they will not have a TV3 translator and the community will receive no direct benefits from the TV3 expansion. On the other hand, the 150 people served by the Te Kao 3 watt relays will have two options: attempt to receive the new TV1 service on channel 2V (band I) using their existing band III antenna, or, invest in a new TV antenna that covers bands I (channel 2V) and III (channel 10V). Those who do not replace their antenna will notice an immediate, very significant, degradation of the TV1 signal (on channel 2V) as band III antennas work very poorly (if at all) on band I channels.

SOUTH ISLAND / NORTHERN PORTION

Based upon Plan 3-C, consumers will be adding band I antennas in numbers.

SITE NAME	TARG. DATE	NEW VIEW.	TV1 CH.	TV2 CH.	PLAN 3C/TV3	1994 TV3	3C Viewer Antenna Changes
Mt. Robertson/ **A**	2nd Q 95	2,022	(8H)?	(3H)?	NONE	?	Unknown
Picton	2nd Q 95	3,129	8H	3H	NONE	?	Existing antenna OK?
Mt. Campbell	2nd Q 95	2,018	?	?	10	11?	Add band III antenna?
South Shore	3rd Q 95	4,644	5H UHF/50	1H	UHF	?	Add UHF antenna?
Sumner	3rd Q 95	2,922	4V	10V	1V	?	Add band I antenna
Cash mere/**B**	3rd Q 95	1,134	?	?	NONE	?	Unknown
Heath cote	3rd Q 95	3,669	4H	10H	1H	?	Add band I antenna
Lyttleton	3rd Q 95	3,894	4H	10H	1H	?	Add band I antenna
Akaroa	1st Q 96	603	7H	9H	2H	?	Add band I antenna
Cheviot	1st Q 96	954	4V	10V	NONE	?	Unknown
Wallace Peak	1st Q 96	1,260	5V	1V	11V	?	Existing antenna OK
Obelisk	Oct.94	9,024	5H	9H	11H	?	Existing antenna OK
Crom well	Nov.94	2,733	7H	2H	NONE	?	Unknown
Queens bury	Dec.94	120	3V	1V	NONE	?	Add band III antenna
Mt. Maude	Dec.94	471	8V	10V	NONE	?	Unknown

a/ Mountain (1,036m) south of Picton at 41.21S, 174.01E
b/ Suburb on southern side of Christchurch

Expand this situation across as many 50 rechannellings and there becomes a new degradation factor which TVNZ is unlikely to applaud; viewers who have invested funds in receiving antennas that satisfied the channelling at the time of the purchase will now find that because of the TV3 expansion their antennas are no longer satisfactory.

Viewers in areas receiving TV3 for the first time and who also face rechannelling of their TV1 and TV2 outlets will be more sympathetic to the need for a new TV antenna; those who end up with the same two TVNZ services while neighbours in the next community are enjoying the added programming for TV3 will not be pleased.

When TV3 was originally proposed, BCL engineers planned for its expansion by setting aside certain channels for TV3 expansion. At the time, in 1989, the 'Plan 3-C' schedule believed TV3

SOUTH ISLAND / CENTRAL AND SOUTHERN REGIONS

Under Plan 3-C very few accommodations were made for 'regional television' and therefore few expansion channels were reserved or planned. Additionally, the 'Queenstown complex' (see CTD: 9401, p.2) presents the most complicated channel-usage situation within a small region for all of New Zealand.

SITE NAME	TARG. DATE	NEW VIEW.	TV1 CH.	TV2 CH.	PLAN 3C/TV3	1994 TV3	3C Viewer Antenna Changes
Wanaka	Dec.94	600	4H	6H	NONE	?	Unknown
Coronet Peak/**A**	Nov.94	507	4V	6V	NONE	?	Unknown
Queens town/**A**	Nov.94	2,082	7H	2H	NONE	?	Unknown
Peninsu la Hill/**A**	Nov.94	1,809	8V	10V	NONE	?	Unknown
Arrow town/**A**	Dec.94	876	8H	10H	NONE	?	Unknown
Sunshine Bay/**A**	Dec.94	450	5H	(none)	NONE	?	Unknown
Abbots ford	3rd Q 95	3,633	6V	8V	NONE	?	Unknown
Dunedin District/**B**	4th Q 95	4,719	?	?	NONE	?	Unknown
Balclutha	4th Q 95	3,729	?	?	NONE	?	Unknown
Kuriwao	4th Q 95	4,767	8H	6H	UHF	?	Add UHF antenna
Tuata pere	4th Q 95	1,083	4V	6V	NONE	?	Unknown
Ravens bourne	1st Q 96	1,620	6V	8V	NONE	?	Unknown
Wingatui	1st Q 96	1,668	7H	1H	NONE	?	Existing antenna OK?

a/ Part of the Queenstown multiple-site complex
b/ Location of site unclear from TV3 released data

was going to be a 'regional television service' rather than a national network. As TV3 ran into financial difficulties by following the regional approach, nearly died as a result and then came back as a national TV network, TV channelling engineers warned that the 1989 'Plan 3-C' would not allow the complete national coverage for TV3. The 'Plan 3-C' approach was the last serious attempt to integrate TV3 into the channelling process.

Since the TV3/NZOA announcement on April 28, neither TV3 nor their engineering consulting firm JDA Associates has been willing to share channelling plans for the TV3 expansion. On the record, JDA's Phil Johnston says "*The final channelling will depend upon negotiations (with TVNZ) and this may last through September.*" Off the record, a member of the TV3 engineering staff insists "*Plan 3-C is dead,*" a not too surprising statement since Plan 3-C included coverage

into areas such as the west coast of South Island (Mt. Rochfort with TV3 on 10V, Paparoa with TV3 on 11H and Blaketown with TV3 on 1H) where TV3 will not go with the original plan. The Plan 3-C channelling schedule was a reasonably sound engineering plan when it was created in 1989 but it was designed for a TV3 'regional service'; it is more likely that in 1994 it is not dead, merely wounded. And, that most of the primary transmitter channellings listed in Plan 3-C will still be with us after JDA has sorted out the rechannellings with TVNZ (read BCL).

THE COST OF THE MOVES

TV3 will contribute approximate NZ$1.1m to the expansion now underway; New Zealand On Air another $4m. Does this also pay for the BCL costs to rechannel the TV1 and TV2 transmitters?

There is one more cost that nobody seems to have measured to date; the cost to consumers for reworking their existing TV antennas (and perhaps also a service call for retuning of older model TV sets to new - rechannelled - transmitters).

TV3 claims that with the expansion 195,000 new Kiwis will have access to their programming. Using 3.4 people per home that comes to 57,353 homes. Some of these homes will be able to receive the TV3 signal with no replacement of their present antenna; others will require a new antenna. Until the negotiated channellings and rechannellings are announced, an accurate analysis of the 'trickle-down' costs to viewing consumers for new antennas can only be roughly estimated. In tables here, using the Plan 3-C channelling data from 1989, we review the 61 new TV3 sites and describe the viewing-consumer antenna situation for each. The results of this analysis appears here. Note that by using Plan 3-C as a basis, 19,284 homes are 'unknown' as to their TV3 addition antenna requirements. The ultimate expenditure will therefore be significantly greater than the number given here.

NEW TV ANTENNA SALES FOR TV3 EXPANSION

Using Plan 3-C as basis for analysis, the anticipated new channellings will result in a need for 24,779 new TV antennas valued at $1,982,320 (based upon $80 retail per antenna). **Not included**: rechannelling of TV1,2.

REGION	NEW BAND III/TV3 ANT	NEW BAND I/TV3 ANT	NEW UHF/ TV3 ANT	UNKNOWN ANTENNA CHANGES	TOTAL NEW ANTENNAS	TOTAL $$ NEW ANTENNAS *
FAR NORTH	8,104	-0-	-0-	(733)	8,104	$638,320
MID/SOUTH North Island	543	3,304	820	(6,404)	4,667	$373,360
Coromandel/ Waikato	3,011	2,339	-0-	(4,291)	5,350	$428,000
NORTHERN South Island	629	3,261	1,366	(2,151)	5,256	$420,480
SOUTHERN South Island	-0-	-0-	1,402	(5,705)	1,402	$112,160
TOTALS	**4,183**	**17,008**	**3,588**	**(19,284)**	**24,779**	**$1,982,320**

COSTS TO NON-TV3 VIEWERS

This is a more complicated analysis because of the 61 new transmitter sites for TV3, 37 (61%) were not considered in the Plan 3-C schedule (additionally: those planned are subject to change as well). We will revisit this subject in a subsequent CTD but for now we can use the Far North segment of North Island as a model since it was well studied as a part of the Plan 3-C work.

TV3 says they will install two primary transmitters (Hikurangi channel 10H, Maungataniwha channel 4V) and from those two primary units feed additional translators at KeriKeri, Ahipara, Mangonui, Kawakawa, Mangawhai Heads and Ngunguru. Two of these locations are presently served with TV1 and TV2 transmitters in Hikurangi (KeriKeri, Kawakawa) but JDA has determined TV3 coverage (on channel 10H) will not be acceptable in these communities from Hikurangi and therefore they plan separate translators. Kawakawa in particular is a difficult site to serve from Hikurangi because it rests on the north slope of a hill with the Hikurangi TV transmitter to the south (west). Portions of KeriKeri have similar problems.

Plan 3-C envisioned moving 23 TV1 or TV2 transmitters at 16 sites to allow TV3 to expand north of Auckland. When Horokaka (9V) was activated (1991) this left 16 transmitters to be rechannelled in the present TV3 expansion. We list them here, based upon 3-C.

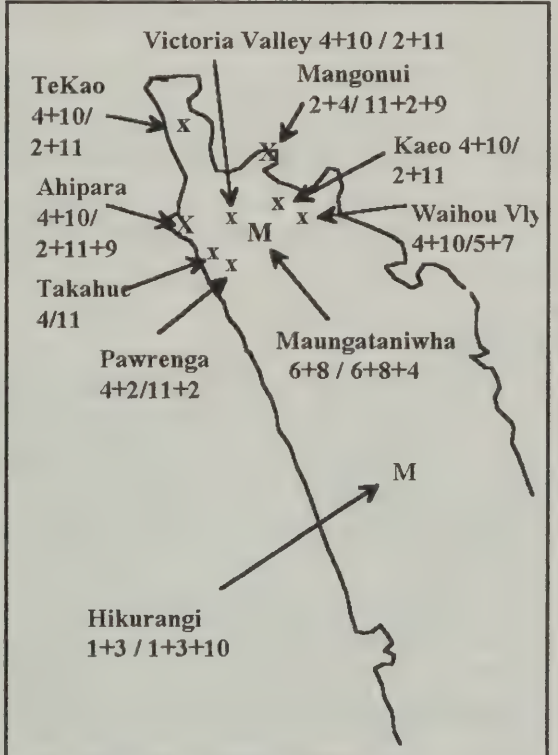
ANALYSIS OF FAR NORTH RE-CHANNELLISATIONS

Sites that will not receive TV3 service, but faced with re-channelling of their TV1 and TV2 services based upon Plan 3-C.

SITE	Present Chs.	Plan 3C Chs.	Ant. Change	Number Homes	Cost to Viewers
Pawarenga	4V(1) 2V(2)	11V(1) 2V(2)	No	95	-0-
Takahue	4V(1)	11V(1)	No	103	-0-
Victoria Valley	4V(1) 10V(2)	2V(1) 11V(2)	Yes	30	$2,400
Te Kao	4V(1) 10V(2)	2V(1) 11V(2)	Yes	44	$3,520
Kaeo	4V(1) 10V(2)	2H(1) 11H(2)	Yes	188	$15,040
Waihou Valley	4V(1) 10V(2)	5V(1) 7V(2)	No	?	-0-
TOTAL					$20,960

NEW TRANSLATORS/FAR NORTH

Ahipara	4H(1) 10H(2)	2H(1) 11H(2) 9H(3)	Yes	256	$20480
Mangonui	2V(1) 4V(2)	11V(1) 2V(2) 9V(3)	No	262	-0-



FAR NORTH PUZZLE PIECES:
First set numbers present channelling; second set Plan 3-C channelling.

Equal Space for Equal Folks

TV3 LOOKS FORWARD TO OUR CORRECTIONS

AND ... Plans New West Coast South Island Expansion

LETTER FROM GERRY SMITH

"2 June 1994

"Some comments in respect to your latest publication.
"Page 28
"a. There is no change for TV3's stance in respect of UHF or VHF channels. Quite simply, we use VHF where possible to make the TV3 signal as easy as possible to be received by the viewer. However, where VHF is not possible, we will use UHF. We already have four UHF sites in operation and, of the 61 new sites underway, I would expect five to be UHF.
"b. Input signals to prospective translators for both the 61 sites underway and any future site, will be assessed on a site by site basis.

However, given the poor performance of the self help translator at Hokitika that used a knife-edge path across the Alps and also the poor results obtained for sites in Northland where you advised a good knife-edge signal existed, I do not see there will be a large number of sites that will rely on refracted paths for inputs.
"c. It should also be pointed out that TV3 will only assure annual translator maintenance costs for self help proposals approved by TV3. Obviously, these self help sites will have to meet certain reliability and performance requirements before we will assume liability for the operational costs.

"The other point I wish to comment on is your item on page 29 regarding the self help TV3 Hokitika translator:

"Page 29
"'Pretty scruffy' is an accurate comment on my assessment of its performance. It appears to be a view shared by the local community and also PacSat Westland.
"I have no idea what you are talking about when you mention the 'decision to limit coverage through skewing of the translation signal away from communities further up-coast.'
"Nothing could be further from the truth and I can only suggest you should have talked to those actually involved in the project to verify your information prior to printing.
"TV3 has never attempted to restrict the coverage of this service and has in fact worked with the communities technical advisor to see if the signal could be extended 'up-coast.'
"I trust these inaccuracies are not symptomatic of other inaccuracies throughout your digest, and I look forward to your corrections in your next issue.

"Gerry Smith
Director of Engineering and Operations"

OUR RESPONSE

It is true TV3 presently has four UHF transmitter sites. For the record, they are:
Number 1/ Towai, channel 42V (Wellington area)
Number 2/ Paeroa Range, channel 42H (Taupo area for relay)
Number 3/ Baxter Knob, channel 42V (Wellington area)
Number 4/ Forest Heights, channel 31V (Wellington area-*)

The origins of our reporting TV3's disinterest in UHF is found in our issue 9401 (p.5) where we related the negotiations that took place in the offices of NZOA 9 November 1993. There, Russ Watson representing a group of people who offered to pay for the equipment to bring TV3 into Queenstown proposed a UHF channel for TV3. We wrote:

"(Watson) *proposed to place a receiving antenna atop Coronet Peak to receive TV3 from its somewhat distant channel 10 transmitter atop Mt. Cargill. Then, using solar panel electricity backed up by diesel generators, and placing the new TV3 equipment inside of a building that already exists for Amateur Radio VHF repeaters, he would broadcast TV3 down into the primary sections of Queenstown using a UHF channel.*

"TV3's Ken Clark said, 'Absolutely not, not on UHF!'."

The same CTD report detailed TV3's reasons given for not using UHF in Queenstown and it came down to a reluctance to allow TV3 to transmit on UHF when TV1 and TV2 were on VHF. Watson had chosen UHF because to use VHF in Queenstown involved major changes to existing TV1 and TV2 transmitter channelling; i.e., "*VHF channels were not available.*"

Knife-edge refracted paths. In November 1992 CTD publisher Cooper proposed to Dr. Ruth Harley (NZOA) that Kaitaia could be given TV3 coverage by taking advantage of a freak of nature. The TV3 Horokaka signals on channel 9 arrive in the central business district of Kaitaia after travelling 115 km by 'bending (refracting) over' a peak known as Raetea (shoulder). 'Simple' AIMCO brand twin five element stacked yagis on approximately 50 Kaitaia private homes had been installed to allow TV3 reception in this Far North community. Cooper had conducted extensive measurements of the TV3 signal in Kaitaia and found it to be exceptionally stable over time; varying no more than +/- 3 dB over a period of one year through all forms of weather.

In the spring of 1992, Harley was interested in any technique that would allow TV3 to expand coverage at less cost than the (then) $16m forecast by TV3 engineering. Kaitaia's 1,360 TV homes could be served by placing appropriate receive antennas on a short (15m) mast in downtown Kaitaia, processing the signals through appropriate electronics, and rebroadcasting to the community. Like Watson, we suggested a UHF channel for rebroadcast but for a different reason than Watson.

Over the period November 1992 to September 1993 Cooper located additional sites in the Far North where knife edge refraction could be utilised to expand TV3 to:

1) KeriKeri, 2) Kawakawa / Morewa, 3) Kaeo, 4) Kaikōne, 5) Doubtless Bay

On October 5, 1993 at the request of engineer Vernon Talbot (working as a consultant to NZOA) Cooper provided geographic map co-ordinates of the proposed knife edge sites to Phil Johnston of JDA Associates; TV3's outside engineering arm. On October 9, 1993 Talbot and Johnston arrived

*/ There is confusion on the status of three of the TV3 UHF transmitters. A 30/11/93 print out from the Registrar of Frequencies lists only Forest Heights as 'owned' by TV3 Network Holdings; the other three do not appear.

in the Far North to conduct tests. We began at Kaitaia where Johnston measured the TV3 Horokaka signal at 0 dBmV (1,000 microvolts) on his small test yagi and we viewed the TV3 signal on a test receiver. The next stop was Doubtless Bay where Cooper had found a location with consistent Auckland (Waitarua) UHF signals (SKY and TAB; 220 km) and the Waiatarua originated FM broadcast signals could be received noise-free using nothing more than a modest automobile whip antenna. Johnston was not interested in that site, choosing instead to explore the slopes of 'Whakaengi' which is where TV1 and TV2 translators operated by TVNZ are located. The TV3 signals found there, from Horokaka, were erratic and severely damaged by co-channel interference originating at the Ruru site for TV3 near Hamilton. Cooper left Talbot and Johnston at this point and they reportedly then tested near Kaeo, KeriKeri and Kawakawa. Talbot would later tell Cooper the Kaeo site was not usable (and it would turn out he and Johnston mistakenly checked for channel 9 Horokaka rather than the Cooper previously tested channel 7 Auckland) and the KeriKeri site could not be properly located (it is on reserve land and can only be reached on foot). Kawakawa's site turned out to be one Johnston had previously identified on his own.

As for the "*poor results obtained in Northland*" related by Gerry Smith, we can only respond that at the one site where we were present (Kaitaia) for measurements, Johnston and Talbot both agreed on the spot the signals were well above minimum thresholds for translator use. We must also report that Johnston showed no enthusiasm for the project and we had the uneasy feeling the measurements were being performed only to satisfy a 'political / negotiating' purpose which TV3 had for their (at that point) ongoing discussions with NZOA for funding. Talbot would later confirm to me the testing was to allow Johnston to write a (negative) report for TV3, to be shared with NZOA. Certainly the Cooper FAX to Harley of October 9, reporting on the Kaitaia tests, would later be at considerable odds with a Johnston report. If the Johnston report 'put down' the use of knife edge 'relay' points, TV3 could then refocus NZOA on the original plan which by October 1993 had dropped to a request for $12m in NZOA funding. Cooper's use of knife edge was an 'obstacle' (pun intended) to TV3 obtaining the big funding it was requesting.

"*Pretty scruffy*" as relates to Hokitika's knife edge path over the Alps from Christchurch. This quotation came from the Greymouth (Evening Star) newspaper which reported:

"*Mr Smith said if TV3 makes a commitment to beam its programmes here it will only be if the reception is 'top notch'.*

"*He is not happy with the reception currently received in Hokitika, which he describes as 'pretty scruffy'.*"

The "*decision to limit coverage through skewing of the translation signal away from communities further upcoast*" originated in CTD for January 1994 (CTD:9401, p.2) where we reported about the installation at Hokitika completed just prior to Christmas. We said:

"*Would-be cable television entrepreneur John Rutherford in planning a cable system for Greymouth sought ways of providing TV3 to the 2 channel community. Rutherford learned that TV3 could be received by a few fortunate homes located near the waterfront in Hokitika, some 37 kilometres to the south. Rutherford sparked interest in Hokitika having a TV3 relay and the town formed a committee and raised nearly $30,000 in pledged cash to build the relay system. Steve Fogarty and Jim Jackson of Motueka firm JSF Electronics were contracted to build the facility. Rutherford offered to donate a five figure sum to the Hokitika TV3 fund raising if he could in turn be promised that the relay would squirt a small amount of TV3 signal up the coast towards Greymouth. He planned to receive and amplify the TV3 signal, and then place it on his*

Greymouth cable system. TV3 allegedly agreed to the Hokitika relay but only if Jackson and Fogerty agreed that everything possible would be done to insure that Rutherford could not pick up the signals in Greymouth. Accordingly, a 25 watt transmitter operating at 5 watts, and transmitting antennas which favoured every direction but Greymouth were installed. And the Hokitika community group reportedly had to also agree not to accept funds from Rutherford's Greymouth cable firm as a further condition to receiving TV3 licensing for their channel 11 relay. TV3 representatives will not admit that any such conditions apply."

This is a complex, potentially legally sensitive, issue. TV3 executives are on record not wishing to encourage cable use of the TV3 signal. On page 35 in January (**CTD**: 9401) we reported:

"TV3's Ken Clark ... was adamant about TV3 belief that cable firms do not have automatic rights to carry TV3 signals."

Similarly, Clark had advised CTD that Kiwi Cable (Kapiti coast area) did not have TV3 written permission to be carrying TV3 on cable and *"is doing so at their own risk."* Television New Zealand was no more supportive of cable having discouraged Kiwi Cable from carrying its two channels for more than a year (**Tech Bulletin**: 9305T, p.16).

On January 14 CTD called the office of JDA hoping to discuss all of this with Phil Johnston. He was on vacation. An employee offered to discuss the Hokitika installation and volunteered that the license for the translator was *"at RFS"* (Ministry of Commerce) and *"will be issued anytime."* We asked about how the knife edge path had worked out. *"Phil says the pictures are surprisingly good"* was the response. We then asked about the use of the signal up the coast in Greymouth. This response came as a surprise:

"I cannot talk about that, but, it is not true that the antennas were purposefully pointed away from Greymouth."

Not pointing at Greymouth? We had not asked that question and on January 14th had no reason to ask that question.

CTD has a reader in Greymouth, a qualified electronics engineer with a keen interest in everything relating to television on the west coast of South Island. We knew he had planned to build a high-gain antenna and construct a super-low-noise GaAs-FET masthead amplifier to allow his family to watch TV3 in Greymouth through the Hokitika channel 11 translator. At his request we don't identify him in what follows; a conversation of January 15.

"How are the pictures?" we asked.

"They would be better if the transmitting antennas pointed up here, and, the transmitter was running at the full 25 watts rather than 5 (watts)" was the response.

"What's that all about?" we asked.

"I talked with (name of an individual who was present at and participated in the installation) *a couple of days ago. He said he was told by* (name of someone associated with TV3) *to 'skew' the transmit antennas to put a null* (weak signal) *towards Greymouth. Then for good measure he was told to throttle down* (reduce) *the transmitter to 5 watts."*

"Just so you couldn't watch the picture in Greymouth?" we asked kiddingly.

"So Rutherford couldn't pick it up for his cable system" was the response.

Like we said, a complicated issue. We publish Gerry Smith's letter at face value, and offer that someplace between Mr. Smith's instructions for the approval of the Hokitika installation, and, the people who did the installation and raised the funds (the December 16th edition of the West Coast Times showed Fogerty and Jackson installing the channel 11 transmitting antennas, and reported 421 families had already paid $50 each to fund the installation) there were some miscues.

Which brings us to a second letter from Gerry Smith (13 June 1994) which states:

"1. TV3 was never directly involved in the plan to extend the Hokitika TV3 service to Greymouth however in response to a question from a local paper TV3 did indicate that it would be prepared to consider a soundly based proposal for such an extension.

"It is our understanding that the project foundered for lack of public support in Greymouth.

"2. TV3 has always had strong reservations as to the quality of the TV3 signal transmitted by the Hokitika translator.

"Our misgivings in this regard were conveyed to the proponents of the scheme via their technical advisor Steve Fogerty.

"In the end TV3 reluctantly agreed to licence the proposal on the grounds that the resultant coverage would be better than no coverage at all and that a permanent high quality TV3 service was still some time away.

"TV3 will be presenting a proposal to NZ On Air for the establishment of a permanent TV3 service throughout the West Coast for consideration at NZ On Air's August meeting.

"3. TV3's technical consultants (JDA) have inspected the Hokitika installation and have also commented that some improvements may be able to be made to the Hokitika translators performance. TV3 has discussed these modifications with Steven Fogerty and has offered to lend the Hokitika group some specialist filters. We are awaiting a response to our offer.

"The local Hokitika community is responsible for meeting the capital and operational costs of the translator with TV3 providing the licence and limited engineering assistance. TV3 has embarked on an ambitious expansion project which involves the commissioning of an average of one transmitter or translator site per week for the next two years. In addition our engineers are working on proposals to bring TV3 to the West Coast and other areas not covered by the recently announced NZ On Air scheme. At this time I am unwilling to divert significant engineering resources to the improvement of self help translators which will not provide a permanent high quality TV3 service."

CTD in our May 1994 issue (CTD: 9405, p.29) reported on the angry response from the West Coast area of South Island following the April 28th joint announcement of TV3 and NZOA. Local newspapers had headlined "*Coast Forgotten In TV3 Extension Funding*" and local politicians had nothing nice to say about either TV3 or NZOA.

TV3 in presenting a new plan to NZOA in August (15-16th) apparently believes there are still funding dollars remaining at NZOA. Chris Prowse at NZOA told CTD "*We understand TV3 has re-engineered service for the West Coast and has the costs down quite substantially; we are anxious to study their proposal.*"

THE PLAN - TV3 WILL ASK NZOA FOR FUNDING IN AUGUST

Use of channel 1, especially at Blaketown site, may be very undesirable to TV3; see text. Information courtesy Gerry Smith, TV3.

Trans-mission Site	Area Served	Completion Date	Population Served	TR Channel/ Polarisation	Viewer Antenna Situation
Mt. Murchison	Murchison Region	2nd Qtr 1996	567	8V	Existing services 1V, 10V; present antenna OK
Mt. Rochfort	Westport Region	2nd Qtr 1996	6,855	10V	Existing services 6V, 8V; TV3 suggests larger antennas for 10V
Reefton TVNZ mw	Reefton Region	2nd Qtr 1996	1,302	**1H**	Existing services 4H, 2H; present antennas OK
Blaketown TR Site	Greymouth	2nd Qtr 1996	7,305	**1H**	Existing services 5H, 3H; present antennas OK
Paparoa	South from	2nd Qtr	10,582	11H	Existing services 7H, 9H; pres.OK

The plan to be presented to NZOA is shown here. It involves new TV3 transmitters/translators at Mt. Murchison, Mt. Rochfort, Reefton, Blaketown and Paparoa. The Paparoa site would take over channel 11 presently in use by the self-help group in Hokitika. This site presently has in excess of 28,000 locally raised dollars invested and there may be some adverse reaction from the more than 500 families who put up $50 each to make it happen.

TV3 is to be applauded for working out the West Coast expansion such that viewers will not require major additions to their existing home antenna systems. However, in our view that is one seriously flawed aspect of the proposal; channel 1 at Blaketown (and channel 1 at Reefton to a slightly lesser extent).

Greymouth area residents (a population of 7,305 to be served on the proposed channel 1) live in a location where trans-Tasman propagation is common. How common? CTD is aware of one study (still ongoing) that shows Australian channel 0 television from transmitters at Mt. Ulandra (NSW) and Darling Downs (Queensland) appear all along the West Coast of South Island at signal levels as great as only 3 dB below 'free space loss' on average between 51 and 56% of the days each year for periods of time that often exceed 10 consecutive hours (9% of the time) during the period December 15 to February 15.

1) For something approaching 90% of all Greymouth residents, pointing their home antennas at Blaketown's transmission site also points their home aerials at the Mt. Ulandra transmitter. Thus the home antennas provide no discrimination against the unwanted Australian signal.

-HOW MANY HOURS PER YEAR TV3 BLAKETOWN WILL NOT BE 'TOP QUALITY'-

TV3 by selecting channel 1 horizontal for Blaketown transmitter site will place 6,500 people using this transmitter in jeopardy from significant Australian interference (* - Ulanda, Darling Downs not same hours; total is sum).

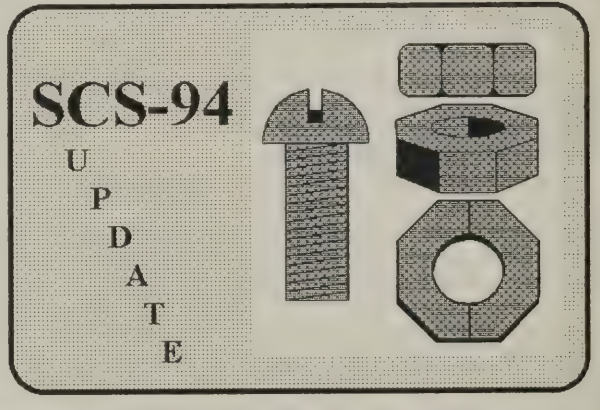
	Greymouth to:	**Transmitter Power**	**True Bearing to:**	**Hours per year severe degra-dation**	**Hours per year stronger than TV3**
Mt. Ulanda	2219km/1379m	100,000 watts	285.1 degrees	610-720(*)	300-350(*)
Darling Downs	2507km/1558m	150,000 watts	308.0 degrees	205-240(*)	90-110(*)

2) The transmission power for Blaketown (100 watts) is 30 dB weaker than the Mt. Ulandra 100,000 watt transmitter and at the distance from Greymouth to Mt. Ulandra (2,219 km) the Australian station (ABMN0) will therefore exceed the received signal on channel 1 from TV3 for between 300 and 350 hours per year; typically between 9AM-12 noon, and, 4PM-8PM local time. For an additional 610-720 hours per year the TV3 signal on channel 1 Blaketown can expect severe degradation (co-channel interference) from the Australian transmitter. Add to this an additional 205+ hours of separate interference from the Darling Downs (RTQ0) 150,000 watt transmitter or the 90+ hours of Darling Downs being stronger in Greymouth than TV3's new transmitter and you have more than 1100 hours per year of something far less than 'top quality television' for Greymouth TV3 watchers.

Gerry Smith is quoted in the Greymouth Evening Star the same week TV3 and NZOA made their announcement stating:

"*If TV3 makes a commitment to beam its programmes here it will only be if the reception is top notch.*"

The unusual propagation conditions which extend across the Tasman are difficult to explain and little understood even after four decades of study. TV3 can avoid becoming a part of that study by simply figuring out a different channel for Blaketown, and by avoiding any use of channel 1 along the west coast of either island, or at the far northern tip of North Island (where, studies suggest, the most severe such trans-Tasman conditions exist).



Satellite-Cable-Seminar 94 is being held September 14-16 (actual sessions begin the 15th, 10AM) at the Angus Inn, Railway Road, Hastings. The show is under the joint auspices of CTD publisher Robert Cooper and ETSA; (the) Electronic Technology Services Association, Inc. The 26th annual ETSA Conference will immediately follow SCS-94 at the same venue September 17-18. ETSA member firms sending representative are charged only for their regular ETSA Conference fees; all others attending SCS-94 are paying $125 for the two+ day event. This does not include lodging.

Registrations passed the 50% point (only 110 may attend because of venue space restrictions) ten days after the first announcement in CTD for May. Registration forms appeared on page 13 of CTD 9405 and in the ETSA Bulletin for June 1994.

C and Ku band home satellite antenna systems from several suppliers will be set up between 12 noon and 6PM on September 14th and attendees are invited to arrive early to learn how this is done. PanAmSat PAS-2 pictures are anticipated on both bands. Early registrants include attendees from Australia, the USA and Asia making this a truly 'international' seminar. As long as space is available, registration forms from CTD (FAX 09-406-1083; P.O. Box 330, Mangonui, Far North) or (after July 02) contact *Nigel Clough* at 04-293-2058 for details.

CHRISTMAS WISH?

WILL SANTA CLAUS BRING Ku BAND DISHES?

PURE SPECULATION - and so labelled

Although nothing official is likely to be announced to the public prior to the safe launch and positioning of PanAmSat PAS-2 to its 169 east location (*), there are increasingly signs that New Zealand may have a domestic Ku band video distribution service within 12 months. Hope for such a DTH (direct to home; also known as DBS for Direct Broadcasting Satellite) package of television channels escalated following a meeting of the SKY Network Board of Directors in Auckland early in June.

A number of proposals involving the extension of SKY service to isolated corners of New Zealand were proposed to the firm during the period April-early June. Each of the plans involved extending SKY service into regions such as Kaitaia and New Plymouth by using various combinations of tape delayed transmissions (i.e., SKY programming sent to planned cable systems in regions too far out to be reached by SKY transmitters), or even private microwave relay systems carrying the SKY services to communities well below the present SKY plans for 'cut-off' (i.e., outside of UHF transmitter service today, not planned to be covered 'tomorrow'). As many as six private entrepreneurs interested in building new businesses by purchasing SKY programming for redistribution depended upon approval of their plans.

One was approved. The rest were disappointed.

Within days of the reports another message began circulating outside of the SKY facility; firms who presently are involved in the contract installation of SKY consumer UHF antennas for SKY customers were drip fed 'hints' that they should sharpen their skills in the area of 'small dish home satellite installations.' Internally at SKY the discussion of satellite system mechanics increased and specialised training materials teaching the basics of satellite system operation were on their way to SKY.

A June 16th Wellington evening newspaper then reported that **Andrew Jordan**, a Vice President of PanAmSat acknowledged his firm was "*negotiating with Television New Zealand for transponder space*" and Jordan took particular care to explain how PanAmSat's PAS-2 satellite will place a "*powerful signal over New Zealand.*"

Meanwhile, at TVNZ, a source told **CTD** there was an ongoing study of compressed digital telecasting techniques and explained, "*It is not beyond the bounds of reasonableness to consider implementing up to 100 narrow interest programme channels using this technique and satellite delivery.*"

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* / PanAmSat PAS-2 was originally to have been launched this past May. Delays in the launch schedule have now pushed the probable launch date to July 8. Only after the satellite has been launched and its proper orbital location verified are any 'formal' announcements likely to come from SKY, TVNZ or PanAmSat.

None of this assures us there will be a Ku band satellite service from PAS-2 directed at New Zealand; all of this says there is ongoing activity at Television New Zealand and SKY Network involving delivery of DTH/DBS programming. What follows is 'educated' speculation.

OFF THE RECORD

SKY Network is faced with several business challenges that lead to the use of satellite. Each is a distinct problem to itself and for the most part each problem's solution has little direct impact on the remaining problems.

1) Programming Rights: SKY Network purchases programming from sources such as ESPN based upon areas of coverage. On paper, SKY has exclusive ESPN rights in the areas of New Zealand where SKY is transmitting.

In reality, SKY's rights to particular programme services are incredibly complex by definition. CNN, for example, granted SKY exclusive rights to its service in New Zealand but only for the retransmission of CNN through SKY's UHF telecasts. This allowed Kiwi Cable at Paraparaumu to negotiate its own contract for distribution of CNN via 'cable.' In theory, CNN could sign a third contract in New Zealand for 'exclusive rights to distribute CNN via MDS (2.3 GHz microwave).' Such contracts, by distribution method, are common in the complex world of world-wide programming rights.

SKY wants to increase its programming channels and towards that end acquired the rights to utilise the 'down time' on the TAB network of transmitters last December (CTD: 9312, p.41). SKY already owns UHF Management Rights to a fourth, unused, UHF channel in each of the markets where it now operates. To increase its programming on a fourth or fifth channel, SKY must enter into new agreements with new programming sources.

If SKY were to negotiate rights to carry, for example, the Ted Turner Cartoon Network/TNT Network package that will be distributed throughout Asia late this year via satellite, SKY could be faced with a repeat of the CNN/Kiwi Cable scenario. SKY could sign an exclusive deal with Cartoon/TNT but it would be specific to delivery via (scrambled/encoded) UHF TV transmitters. If they did that, Cartoon/TNT could then come back in a year or two and sign another deal with a cable operator, a third deal with an MDS operator, and a fourth deal with a satellite DBS firm; all providing service to some segment of the New Zealand marketplace. Multiply those options, now, against SKY signing an agreement to use Cartoon/TNT for satellite delivery which grants to SKY the right to "*Serve all customers within New Zealand who will receive this service via satellite.*" In this situation, SKY wraps up Cartoon/TNT for use itself at SKY terrestrial UHF transmitters, for direct resale to DTH/DBS viewers, for sale to MDS operators and for sale to cable operators.

It is the programming, or software as it is known in the trade, which drives the business. SKY understands this; TVNZ understands this. Having 'exclusive legal contractual rights' to programming services eliminates those services from competing with you in some other delivery form.

By becoming a DTH/DBS operator, SKY changes the terms of its contracts with programme suppliers. It broadens by definition the delivery methods it uses to sell programming, and of even greater importance, because the satellite service reaches all of New Zealand, a contract that includes DTH/DBS rights prevents others from purchasing the rights for 'segments of New Zealand.'

Therefore to eliminate potential competitors in the future, SKY must purchase at least 'New Zealand satellite delivery rights' to the programme sources it selects. Anything less than 'full satellite rights to New Zealand' leaves the door open for a competitor to offer the same service at some future date.

2) Programming mixes. SKY has learned a somewhat painful, and expensive lesson with the operation of its first three channels. When a channel is programmed with a mixture of locally produced or locally edited programming (such as the SKY 'News Channel' which mixes BBC, ITV and other news sources together, with CNN, to produce a full broadcast day), the costs associated with programme production are very high. SKY had hoped that by selling advertising time on its network, it would not only recoup these production charges but would also make a profit with this aspect of the business. This has proven to be a very elusive profit source.

The least complicated and therefore the least expensive situation for SKY is to simply receive programming from a (foreign) source via satellite and plug that programming directly into its TV distribution network. Most such services have 'local' (meaning, in this case, within New Zealand) advertising slots built into the programming, and the networks utilise electronic cues initiated from a distant point that start and stop video tape machines pre-loaded with 'local' commercial announcements. SKY would save a considerable amount of money each year, but not lose its ability to sell commercial time, by plugging into one or more of these networks. All they lose in the process is the ability to 'rearrange programming' time slots.

Programming which has a 'timeliness' is difficult to simply receive (via satellite) and 'run' because certain programmes play well at night, others play well in the morning. A cooking programme, for example, makes far more sense at 10AM than at 10PM. Unfortunately, New Zealand is from 8 to 12 hours removed from programming schedules that cater to 'time of day' and this means we are badly out of sync with programme schedules designed for people in New York or London.

Sports and news programming demands a combination of 'live in time' and 'being in sync' with local life styles in the region where the programming is shown. SKY has attempted to rearrange its news and sports channels to accommodate these demands; it has been difficult.

Recently there has been an abundance of sports programming that coincides with other sporting events. Soccer, for example, plus rugby plus (US) NBA (National Basketball Association) finals have occurred 'live in time' at the same time and SKY has was to move sporting events to their news channel on occasions in June. This means the news is pre-empted in favour of two simultaneous sporting events. Some news oriented viewers have been unhappy with this.

Having more channels available, having the ability to move sporting events around within a 'platform of channels' rather than being restricted to a single sporting channel, will greatly help SKY scheduling. As the universe of available sporting events grows, it is very unlikely a single 'sports channel' will handle the myriad of sporting events available to the South Pacific. SKY looks to the additional satellite transponder space as a new flexible tool to allow it to cope with future months that are similar to the June they have just come through.

3) Terrestrial delivery costs. Each new SKY transmitter site has to receive its signal via microwave relay. Television New Zealand owns 16.3% of SKY Network at this time and Television New Zealand also owns BCL. It is BCL which is the primary provider of microwave relay service to SKY.

"*Microwave relay is the third most expensive item in our budget; right after programming and personnel,*" notes a TV3 executive. SKY presently spends an undetermined sum per month for relaying of its programmes as far south as Dunedin. For 16.3% SKY owner TVNZ that's a nice monthly revenue stream; for the remaining 83.7% ownership of SKY it is an expense that can be partially or totally avoided (in the future as BCL contracts run out) by simply allowing each SKY transmitter site to receive the PAS-2 service directly.

SKY can actually save more money per year by using PAS-2 than it will cost it to rent transponder space on PAS-2. Moreover, given the 'new world' of compressed, digital video

transmission (CTD; 9308, p.2) , SKY can add or subtract 'programme channels' via satellite at will, and switch terrestrial transmitter inputs from a sporting service to a news service to a second sporting service all from Auckland and all by remote control at will.

4) Building the customer base. One of the beauties of 'going satellite' for SKY is that the very same satellite signal they will ultimately be using to interconnect to their terrestrial transmitters spread throughout North and South Island will also serve DTH/DBS SKY subscribers. CTD investigated this subject in our December 1993 issue (CTD: 9312, p.16) and here is what we said seven months ago:

"Consider now the 273,448 New Zealand homes beyond SKY reception at the existing 15.5% (**) penetration level of SKY; or 42,931 homes (**). And break those 42,931 prospect homes into a five year period selling equal numbers (8,586) home terminal dish systems each year.

"...a SKY TV base of 110,000 homes (**), each paying SKY $40 per month, adds up to $52,800,000 per year."

**/ The SKY penetration is now between 21 and 22% according to SKY figures; thus rather than anticipating SKY sales of 15.5% (42,931 homes) for SKY service via satellite, we would now anticipate at least today's level of penetration within the 273,448 homes that remain outside of SKY terrestrial reach. This translates to 57,424 homes (21% of all unserved homes) subscribing to the SKY satellite DTH/DBS service within a five year period.

At $40 per month per home, gross income to SKY becomes 57,424 homes times $40 ($2,296,960) per month times 12 months or $27,563,520 per year. In CTD for April 1994 (CTD: 9404; p.2) we investigated the costs associated with uplinking programming from New Zealand and using a satellite to redistribute across the full country. We updated that report in May (CTD: 9405, p.2) and here's what it said:

"A broadcast quality TV programme can be relayed by PAS-2 for NZ$875,000 per year."

Putting that into perspective, when SKY reaches a 21% penetration (57,424 homes) served via DTH/DBS in New Zealand, it will be spending NZ$15.24 per home per year for transponder space; per channel.

Using existing SKY rates rounded down to $40 per month for three channels, SKY collects NZ$160 per channel per year now from subscribers; $15.24 per channel per subscribing home will amount to 9.53% of the receipts from that home per year. This compares very favourably with the present SKY costs to deliver a channel of their programming to terrestrial viewers watching UHF transmitter signals. Very favourably.

It is evident, then, that SKY will reach a sizeable new subscriber base via satellite at a cost which compares with the present costs to reach terrestrial subscribers. Moreover, it will do so nation-wide 'instantly' with no long, drawn out delays while terrestrial transmission sites are built and microwave relays are installed.

4) Subscriber install costs. SKY does not always recover the full costs of the SKY terrestrial installation at the time of turning a subscriber 'on.' Contract installers, UHF antenna costs, lead-in wire and attachments, plus the ever-present decoder add up to more than $300 SKY investment each time a subscriber goes on line (see this issue, page 41, for a review of SKY decoder landed costs).

SKY DTH/DBS subscribers will purchase their own satellite dish and receiver systems, and the decoding equipment .... well, that's a grey area for the moment. What is probable is that SKY will not distribute decoders to rural New Zealand, rather that SKY DTH/DBS subscribers will be required to purchase a receiver which has a built-in decoder that can be 'addressed' by SKY using

either the present authorisation card (**CTD**: 9404; p.29, 36; **CTD**: 9405: p.29) or another of the widely used satellite-stream authorisation techniques.

We suggest SKY will create a network of authorised DTH/DBS service providers who will be contracted to assist SKY 'Rural Customers' with both the installation of their satellite hardware, and, the SKY satellite authorisation process. Sky will provide "Rural Installers" with complete Ku band receive system packages, or, allow installers to source outside provided the terminals meet SKY engineering specs.

Much remains to be sorted out here. Because of the likelihood that SKY will be using compressed digital video techniques to distribute its programming within 12 months of launching the DTH/DBS service, the initial service, we believe, will be **(a)** analogue, three channels on average, and, **(b)** 'in the clear' (i.e., not encoded in analogue form). When the switch is made to compressed digital video we would anticipate that SKY will then use the digital format as a means of ensuring customer payment for its services.

THE TVNZ PART IN THIS

When Television New Zealand announced its own plans to fund and build four regional television programme stations May 25, an equally important announcement made at the same time was unnoticed by many. TVNZ said it will, from the first of 1995, begin transmitting "BBC World Service Television" over TV1 transmitters between the normal close-down hour and the next morning's sign-on time. Typically, this means on average 6 hours per 'night' of BBC WSTV. The BBC service will be delivered into New Zealand via satellite.

TVNZ research since 1990 has focused on the expansion of programming channels and on contracting for as many of the most desirable programming services available as possible, to the exclusion of these desirable services being available to a competitor. By tying up BBC WSTV, TVNZ precludes someone else bringing the service into New Zealand on a full 24 hour basis.

The likelihood is that TVNZ will be an active part of the SKY DTH/DBS service, ultimately (if not initially) providing programming for the 'compressed digital bundle' of services which SKY will market to viewers nation wide. It is also likely that these services will be offered to DTH/DBS viewers 'ala-carte' (the viewer elects to view the scrambled transmissions, programme by programme or channel by channel, after agreeing to pay a monthly fee for the service). This TVNZ need will help further define the parameters for Ku band viewing terminals sold into New Zealand.

To satisfy the diversified viewing options offered by SKY or through TVNZ, terminals will have the following technical parameters for PAS-2 service:

1) Dish size: 1.2 metre typical but smaller (to .9 metre) in certain situations
2) Frequency range of receivers:
   a) Vertically polarised signals: 12,250 - 12,600 MHz
   b) Horizontally polarised signals: 12,430 - 12,750 MHz
3) Receiver bandwidths: 27 MHz for analogue (digital to be determined)
4) Addressability: Individually addressable, per programme channel; system to be defined
5) LNB noise figure: 0.9 dB or lower
6) Dish tracking: None required
7) Dish look angles: **Kaitaia** / elevation 49.01 / true azimuth 352.75; **Auckland** / elevation 47.20 / true azimuth 350.87; **Hastings** / elevation 43.74 / true azimuth 348.25; **Wellington** / elevation 42.09 / true azimuth 351.72; **Christchurch** / elevation 39.90 / true azimuth 355.05; **Greymouth** / elevation 41.40 / true azimuth 356.85; **Dunedin** / elevation 37.58 / true azimuth 358.18.

TECHNOLOGY
BYTES

...BITS AND BYTES YOU MAY HAVE MISSED IN THE RUSH TO MAKE A BUCK ...

July 08, 1994 / ISSUE 94-07-10

SATELLITE TV

New Zealand domestic DTH/DBS service uplinked by SKY and TVNZ (see report this issue, p.27) is likely to be 'in the clear' for several months at outset as a minimum.. If this happens, an instant 'surge' in home dish sales in rural New Zealand could follow. Unfortunately, that would be a tragic mistake for those purchasing analogue format receivers since SKY/TVNZ changeover to compressed digital video (as addressable receiving equipment becomes available) will make the older (present) style analogue receivers useless for future SKY/TVNZ satellite reception.

SKY Network (Auckland) has 3.0 metre dish trained and ready for first signs of PAS-2 signals. The PAS-2 footprint reaches a predicted +44 .4 dBw level across all of North Island, South Island to just north of Queenstown; 43.40 dBw for balance of South Island. However, much of NSW has 47.40 dBw while 44.3 dBw region in Australia reaches from Brisbane to northern Tasmania, across all of southern and western Australia. To our north, signals drop rapidly and Fiji (et al) are not inside small-antenna footprint (**CTD**: 9312, p.6 for coverage map). PanAmSat told CTD on June 27 "*All systems are go for July 8th launch*". Their Australian telephone numbers are changed: (Tel) 00-61- 2-251-8833, (FAX) 00-61-2-251-8382.

GloboStar Satellite Communications Systems (CIS) C plus Ku bands satellite scheduled for 162 east in October 1995 will use 3,700-4,180 MHz in C band, 11,096-11,200 plus 11,460-11,700 in Ku band with 50 dBw footprints. The frequency range will add yet another 'Ku band frequency range ' to the growing bandspread of South Pacific satellites.

Auckland University tender for 7.3m dual-axis tracking satellite dish system has been awarded to TISCO of Auckland. TISCO's Tony Dunnett heads up a team that will install an Orbitron model T24 dual-axis tracking dish to be used by the University's language, economics and science study programmes. The bid tender called for automatic tracking of satellites in inclined orbit, full horizon to horizon dish movement for satellites between 96.5 east and 116 west, C and Ku band feeds with ability to select right hand circular, left hand circular, linear vertical and linear horizontal reception feeding three or more simultaneous satellite and narrow-band receivers routed through a network of standards converters and video taping machines. The concept calls for different University disciplines to have access to live television and audio programming via satellite originating from through Europe, Asia, the Pacific and the Americas. The language departments will access daily television programming (including newscasts) from countries such as China and Japan and will utilise the programmes as a part of their studies. The facility will be staffed by University personnel, will tape most reception for library archiving, and plans to create a cable distribution system to feed the programming from the Tamaki Campus site to sections of the University in the future. The 7.3m dish is hardly your average back yard size product weighing more than 1.5 tonnes before installation. Project design has been done by Brian Oliver who will describe the planning for the system during an SCS-94 talk scheduled for 10:45AM on September 16th in Hastings. Target completion date of the system is September 18th.

-IMPORTANT NOTICE / CTD OFFICE CLOSED-

Coop's Technology Digest (Mangonui) office will be closed from July 10 to September 5 during an extended research trip out of New Zealand. However: Mail and subscriptions will continue to be routinely processed, and ALL questions concerning SCS-'94 (Satellite -Cable - Seminar 1994) will be handled by Nigel C. Clough at 04-293-2058. The next scheduled issue of CTD is September 16 which coincides with the SCS-94 event in Hastings.

Sydney region councils are suggesting new regulations to "*ban unsightly satellite dishes*," a move that possibly has significant impact on the growth of direct to home satellite transmissions into the NSW region. Following announcements promising to make cable television services available in the area (**CTD**: 9404, p.20) the 'anti-satellite-dish' movement suddenly gained momentum with most community councils seeming to agree that satellite dishes in excess of 60cm size should either be banned totally, or require a 'special licence' to own and install. If licences are granted, the regulations require colour co-ordination and *"where practical, mounting the dishes at ground level with shrubs surrounding."* The competitive to satellite and cable MDS (multipoint distribution service) 2.6 GHz microwave antennas (typically under 30cm in size) do not escape the ruling; they too require permits of a different type. In most of the Sydney district communities, normal TV aerials do not require permits. In the US, similar 'zoning/permit' regulations were pre-empted on constitutional grounds by the FCC (federal agency) in 1985 ending a brief attempt by local councils to regulate citizen access to programming under the guise of environmental uniformity.

World Cup Soccer transmissions are frequently found on Intelsat 701 (174 east), 511 (177 east) and 508 (180 east) at press time. Games fed into New Zealand and Australia are predominantly on 508; to Asian and Pacific Ocean countries on other two satellites.

Optus personnel are denying there is a technical problem with one or more of their transponders carrying television programming but those who monitor the services at the outer edges of normal coverage are equally sure a problem exists. Optus B1 at 160 east is the most recent Australian satellite successfully launched and it carries the bulk of DTH/DBS television to the country. There are 15 transponders on board, all capable of up to 50 watts of power although most are run at significantly lower power levels. The 15 transponders are capable of being attached to Optus selected transmitting beam patterns with different beams for different segments of the country. One of these beams is capable of placing high quality service over New Zealand but except for short-term testing has never been deployed commercially. Lacking that special beam being 'turned on' two other intended-for-Australia beams 'leak' into portions of New Zealand (primarily southern portion of North Island (Auckland south) and west coast of South Island. One of these, the Southeast beam which favours NSW, Victoria and Tasmania,) is used by the SBS (ethnic broadcasting) network; transponder 5. The other is the national (A) beam which covers the entire country and is used by the ABC network; transponder 7. In theory (although not necessarily in practice) the SBS signal on transponder 5 would be as strong or stronger in New Zealand than the ABC service. In practice, Optus appears to operate SBS at well below its 50 watt rated output while ABC nominally is at greater power (but still below 50 watts rated). The ABC service has traditionally been stronger than SBS in New Zealand, until mid-June when a number of signal ups and downs occurred followed by ABC settling down to a lower than SBS level. Optus people deny anything unsavoury has happened to the ABC transponder and denies having 'played' with their antenna patterns. New Zealanders know what they measure and they measure ABC as 'down.' Conclusion: If Optus controllers have not been playing, the satellite has been. And what New Zealanders measure is not a very healthy sign.

Lenfest (Ucom/Australia), which paid A$194 million for legal rights to distribute pay television programming using OPTUS satellite(s), has entered an agreement with Australis Media Limited to 'swap shares' allowing each firm to

-USING OUR SATELLITE-LOOK-ANGLE CHARTS-

The first requirement for any satellite reception is that the receive terminal be able to 'see' the satellite. The satellite's location is known (at some point directly above the equator - measured in degrees east or west of the prime meridian- at a height of approximately 36,000 km), and, the latitude and longitude of the receiving (station) location is known. By employing a modest computer programme, the 'look-angles' are calculated and proof of line-of-sight is completed.

In the two sets of tables to follow (first is for locations near Kaitaia, Auckland and Wellington on North Island; second is for locations at or near Greymouth, Christchurch or Dunedin on South Island) each satellite (far-left column) has two important numbers for each location: El. (elevation) is the number of degrees above the horizon (smooth earth is assumed) the dish will point when aimed properly at the satellite; True Az (azimuth) is the north-corrected compass bearing from the specified location to the satellite (where 0 degrees would point directly at true-north). With these two calculated numbers for any satellite location, you can position yourself at the planned satellite location to determine whether any trees, buildings, hills or other 'objects' will block the satellite dish's view (line of sight) to the satellite. For a fuller discussion, see **Tech Bulletin** 9404T, or, attend SCS-94 in Hastings September 15-16.

-SATELLITE 'LOOK-ANGLES' FROM NEW ZEALAND-

Base data, computations courtesy Nigel C. Clough, 29 Matai St., Waikanae / 04-293-2058

SITE	NORTH ISLAND			KAITAIA		AKLND		WLGTN	
LONG.				173.18E		174.47E		174.47E	
LAT.				35.08S		36.55S		41.17S	
Polar Dec				5.65 deg.		5.84 deg.		6.40 deg.	
SAT	**Location**	**BAND**	**Pol.**	**El.**	**True Az.**	**El.**	**True Az.**	**El.**	**True Az.**
Stat.14	**96.5E**	**C**	**Linear**	**2.18**	**277.75**	**0.94**	**277.23**	**0.33**	**277.99**
Asiasat 2	100.5E	C	Linear	5.44	280.16	2.07	278.98	3.31	280.71
Stat.21	**102.7E**	**C**	**CP**	**7.24**	**281.53**	**4.75**	**280.71**	**4.95**	**282.25**
Asiasat 1	**105.5E**	**C**	**Linear**	**9.53**	**283.28**	**8.15**	**282.91**	**7.04**	**284.21**
Palap2R	**108.0E**	**C**	**Linear**	**11.57**	**284.89**	**10.15**	**284.54**	**8.91**	**285.99**
PalapC1	113.0E	C	Linear	15.64	288.23	14.13	287.94	12.58	289.69
PalapaB4	**118.0E**	**C**	**Linear**	**19.67**	**291.79**	**18.08**	**291.54**	**16.22**	**293.57**
Raduga27	128.5E	C	CP	27.91	300.15	26.12	299.91	23.73	302.49
Rimsat(1)	130.0E	C/Ku	CP	29.04	301.49	27.25	301.24	24.59	303.85
ApStar1	131.0E	C	Linear	29.79	302.39	27.99	302.14	25.25	304.78
Goriz.17	**134.3E**	**C/Ku**	**CP**	**32.11**	**305.41**	**30.27**	**305.02**	**27.31**	**307.79**
Stat.7	139.9E	C/Ku	CP	36.22	311.31	34.29	310.93	30.88	313.78
Rimsat(2)	142.5E	C/Ku	CP	37.88	314.09	35.93	313.66	32.35	316.53
OptusA3	**156.0E**	**Ku**	**Linear**	**45.33**	**331.72**	**43.32**	**330.71**	**38.79**	**333.11**
Optus B1	**160.0E**	**Ku**	**Linear**	**46.89**	**337.83**	**44.92**	**336.57**	**40.16**	**338.59**
Coupon3	162.0E	C/Ku	CP	47.54	341.02	45.49	339.63	40.73	341.43
Optus A2	**164.0E**	**Ku**	**Linear**	**48.09**	**344.29**	**46.17**	**342.76**	**41.22**	**344.32**
PanAm2	169.0E	C/Ku	Linear	49.01	352.75	47.21	350.87	42.09	351.72
Rimsat(3)	170.75E	C/Ku	CP	49.23	357.51	47.51	355.44	42.33	355.85
Intel701	**174.0E**	**C/Ku**	**CP**	**49.25**	**1.43**	**47.59**	**359.21**	**42.42**	**359.29**
Intel511	**177.0E**	**C/Ku**	**CP, LP**	**49.05**	**6.63**	**47.51**	**4.24**	**42.35**	**3.84**
Intel508	**180.0E**	**C/Ku**	**CP, LP**	**48.61**	**11.76**	**47.19**	**9.23**	**42.08**	**8.37**
Intel503	**177.0W**	**C/Ku**	**CP, LP**	**47.93**	**16.76**	**46.64**	**14.14**	**41.62**	**12.84**
SatcmC5	139.0W	C	Linear	25.49	62.49	25.72	60.55	23.21	58.03
SatcmC1	**137.0W**	**C**	**Linear**	**23.92**	**64.11**	**24.21**	**62.24**	**21.83**	**59.81**
SatcmC4	135.0W	C	Linear	22.35	65.68	22.69	63.88	20.44	61.54
GlxyG1	**133.0W**	**C**	**Linear**	**20.76**	**67.21**	**21.15**	**65.46**	**19.04**	**63.23**
SatcmC3	**131.0W**	**C**	**Linear**	**19.16**	**68.68**	**19.59**	**67.01**	**17.61**	**64.87**
GlxyG5	**125.0W**	**C**	**Linear**	**14.31**	**72.89**	**14.88**	**71.41**	**13.27**	**69.61**
SpNetS1	**120.0W**	**C**	**Linear**	**10.23**	**76.17**	**10.89**	**74.84**	**9.59**	**73.32**
Morelos2	116.0W	C	Linear	6.96	78.69	7.71	77.47	6.62	76.19

-SATELLITE 'LOOK-ANGLES' FROM NEW ZEALAND-

Base data, computations courtesy Nigel C. Clough, 29 Matai St., Waikanae / 04-293-2058

SOUTH ISLAND

SITE				GRYMH		CHCH		DNDIN	
LONG				171.12		172.4		170.3	
LAT				42.28		43.33		45.52	
Polar Dec				6.52		6.4		6.87	
SAT	**Location**	**BAND**	**Pol.**	**El.**	**True Az.**	**El.**	**True Az.**	**El.**	**True Az.**
Stat.14	**96.5E**	**C**	**Linear**	**2.63**	**280.48**	**1.51**	**279.78**	**2.58**	**281.71**
AsiaSat2	100.5E	C	Linear	5.56	283.31	4.39	282.64	5.34	284.71
Stat.21	**102.7E**	**C**	**CP**	**7.16**	**284.91**	**5.97**	**284.26**	**6.85**	**286.39**
AsiaSat1	**105.5E**	**C**	**Linear**	**9.21**	**286.96**	**7.97**	**286.31**	**8.76**	**288.56**
Palap2R	**108.0E**	**C**	**Linear**	**11.01**	**288.83**	**9.75**	**288.2**	**10.46**	**290.56**
PalapC1	113.0E	C	Linear	14.59	292.71	13.27	292.09	13.8	294.61
PalapB4	**118.0E**	**C**	**Linear**	**18.11**	**296.78**	**16.73**	**296.16**	**17.06**	**298.87**
Raduga27	128.5E	C	CP	24.9	305.99	23.43	305.42	23.33	308.5
Rimsat(1)	130.0E	C/Ku	CP	26.07	307.62	24.59	306.92	24.38	310.07
ApStar1	131.0E	C	Linear	26.69	308.61	25.21	307.91	24.95	311.08
Goriz.17	**134.3E**	**C/Ku**	**CP**	**28.58**	**311.83**	**27.21**	**307.85**	**26.71**	**314.37**
Stat.7	139.9E	C/Ku	CP	31.88	318.02	30.35	317.14	29.63	320.58
Rimsat(2)	142.5E	C/Ku	CP	33.23	320.95	31.71	320.04	30.84	323.54
OptusA3	**156.0E**	**Ku**	**Linear**	**38.82**	**338.12**	**37.35**	**336.79**	**35.71**	**340.34**
OptusB2	**160.0E**	**Ku**	**Linear**	**39.89**	**343.71**	**38.47**	**342.23**	**36.61**	**345.71**
Coupon3	162.0E	C/Ku	CP	40.31	346.58	38.92	345.03	36.95	348.44
OptusA2	**164.0E**	**Ku**	**Linear**	**40.65**	**349.48**	**39.31**	**347.86**	**37.23**	**351.21**
PanAm2	169.0E	C/Ku	Linear	41.14	356.85	39.91	355.05	37.58	358.18
Rimsat(3)	170.75E	C/Ku	CP	41.21	0.51	40.05	358.73	37.57	1.69
Intel701	**174.0E**	**C/Ku**	**CP**	**41.11**	**4.28**	**39.99**	**2.33**	**37.47**	**5.18**
Intel511	**177.0E**	**C/Ku**	**CP, LP**	**40.82**	**8.71**	**39.81**	**6.69**	**37.18**	**9.35**
Intel508	**180.0E**	**C/Ku**	**CP, LP**	**40.35**	**13.07**	**39.43**	**11.01**	**36.72**	**13.47**
Intel503	**177.0W**	**C/Ku**	**CP, LP**	**39.71**	**17.36**	**38.88**	**15.26**	**36.11**	**17.53**
SatcmC5	139.0W	C	Linear	20.32	60.45	20.62	58.83	18.08	59.72
SatcmC1	**137.0W**	**C**	**Linear**	**18.95**	**62.17**	**19.29**	**60.59**	**16.81**	**61.47**
SatCmC4	135.0W	C	Linear	17.57	63.85	17.95	62.32	15.51	63.21
GlxyG1	**133.0W**	**C**	**Linear**	**16.17**	**65.51**	**16.59**	**64.01**	**14.19**	**64.89**
SatcmC3	**131.0W**	**C**	**Linear**	**14.76**	**67.11**	**15.21**	**65.65**	**12.87**	**66.55**
GlxyG5	**125.0W**	**C**	**Linear**	**10.46**	**71.74**	**11.02**	**70.42**	**8.83**	**71.36**
SpNetS1	**120.0W**	**C**	**Linear**	**6.83**	**75.43**	**7.47**	**74.21**	**5.41**	**75.22**
Morelos2	116.0W	C	Linear	3.91	78.29	4.61	77.14	2.65	78.21

-COOP'S FEARLESS SATELLITE PROGRAMMING FORECAST-

This is our continuing update of the likelihood that specific satellite-delivered TV programme services will be available to New Zealand users. This listing does not deal with whether a specific service will be 'encrypted' or 'free-to-air,' only whether it is likely to appear on a satellite such that a modest sized C-band dish (3m or less) or Ku-band dish (2m or less) could receive the programming service here. This listing updates with each issue of CTD as the elements that go into making these forecasts change or are clarified by potential programmers. Percentage is likelihood that a particular service will be available into New Zealand.

100%: **CNN** (508 + PAS-2), **ESPN** (508), **ABS/CBN** (Philippines PAS-2). 75%: (NZ) **SKY Network** (Satellite Direct) for at least 3 programme channels (PAS-2), (NZ) **TVNZ** for at least 2 programme channels, Viacom **MTV/Nickelodeon/VH1** (PAS-2), (Australian) **Ch.9 Pacific Service** (PAS-2). 50%: (UK) **Prime Sport/Star Plus** (PAS-2), **Discovery** Asia/Pacific (PAS-2), **BBC World Service** (PAS-2), **Fox Cable International** (PAS-2), **Country Music Television** (PAS-2). 25%: Australian **Sky Horse Racing/Sports** (508), **Comedy Central** (PAS-2), **Trinity** (USA religion; PAS-2), **USA Network** (PAS-2),**TNT/Cartoon Network** (PAS-2).

own a part of the other and ending with Lenfest owning a controlling interest in Australis. The next step, according to Australian sources, is for a pair of 'public floats' to be offered which would raise A$200m and thereby 'retire' the debt incurred originally by Lenfest to acquire the DBS rights in Australia. Despite of all of this financial activity, no pay-TV DBS broadcasting has begun to date in Australia.

Trade Practices Commission (TPC) in Australia is investigating complaints *"filed by unnamed parties charging* (American cable company) *TCI, US partner with Australis Media, as seeking to monopolise Australia's pay-TV market."* The complaints allege *"TCI is promoting itself in the US as sole supplier of pay TV programming in Australia to convince production houses to use its wholesaling facilities."* Alas, the first serious distribution of pay-TV has yet to begin in Australia.

Star TV Asia is hopeful of concluding channel programming agreement with VIVA!, the new international competitive all music service planned by music industry giants Bertelsmann, Polygram, Sony, Thorn EMI and Warner Music. MTV Asia lost its channel space on Star TV's Asiasat package (**CTD**: 9405, p.18) but plans return on Apstar 2 satellite when available early in 1995 (see below). Reportedly, Murdoch's Star TV is trying to sell a 50% interest in its music channel 'slot' for around NZ$75m and VIVA! has been in negotiations for the space. Meanwhile, in Europe, MTV is not taking VIVA! threat calmly having filed complaint with EC alleging consortium plan to set up VIVA! service is 'illegal under German law.' Record companies have responded that because of MTV 'domination of German music TV market', they should be granted exemptions from competition clauses in EC regulations. Thorn EMI is apparently in the throes of renaming its many divisions with reports its Capitol and Virgin records division will become known as EMI Music shortly.

UPDATE: UNUSUAL C BAND SATELLITES FROM NEW ZEALAND

CTD for May (9405:p.17) listed experimental results from satellites at our western horizon (between 96 and 120 east) as well as those at our eastern limit (137 to 116 west). Additional observer data is now in hand which may provide assistance to those with 4m and larger dishes now engaged in research at our 'outer limits.'

Stationar 14 at 96.5 east is reported by at least one observer although the look angle is exceptionally low (under 1 degree; i.e., right at the horizon). Moscow sources list the New Zealand footprint on the 3675 MHz transponder as 32.4 dBw. Television service is DUBL TV, SECAM, right hand circular polarisation, with sub-carrier audio on 7.0 MHz. Also, Radio Majak has an audio sub-carrier at 7.5 MHz.

Stationar 21 at 102.7 east might be confused for 96.5 east as it has similar services. See look-angle charts this issue for pointing data and note need for a method of accurately measuring the dish look-angle to verify which of these two satellites you are seeing.

Asiasat 1 at 105.5 east on 3860 MHz horizontal (Prime Sports) is in NTSC with linear vertical polarisation, audio on 5.58 and 5.76.

Palapa B2R at 107.7 east on 4,000 MHz horizontal has TVRI (network) in PAL, audio 6.8 MHz.

Palapa B2P at 112.9 east on 3860 MHz (Canal France International) is horizontal with programming primarily in SECAM; on 3900 MHz (ABS-CBN service from Philippines) is horizontal in NTSC; on 4180 MHz TOPAZ is horizontal.

UPDATE: RUSSIAN SATELLITES TO OUR WEST

Recent issues of **CTD** have reported on New Zealand reception of Russian C band satellites from orbital locations that place these birds virtually 'at the western horizon' for most Kiwi observers. Because more than one Russian satellite is clustered close to the western horizon, positive identification of a specific satellite has been difficult.

Reader **Tony Dunnett** (Field Service, TISCO Limited; FAX 09-625-4523) provides data which helps clarify the 'which Russian satellite?' question and his material comes in the form of a detailed FAX to Dunnett directly from **V. Borovkov** (Marketing Department) at Intersputnik, Moscow.

Borovkov lists the following satellites as being within 'view' of at least some New Zealand earth terminals:

Statsionar-14	96.5 degrees east
Statsionar-21	103 degrees east
Statsionar-7	140 degrees east
Statsionar-18	145 degrees east

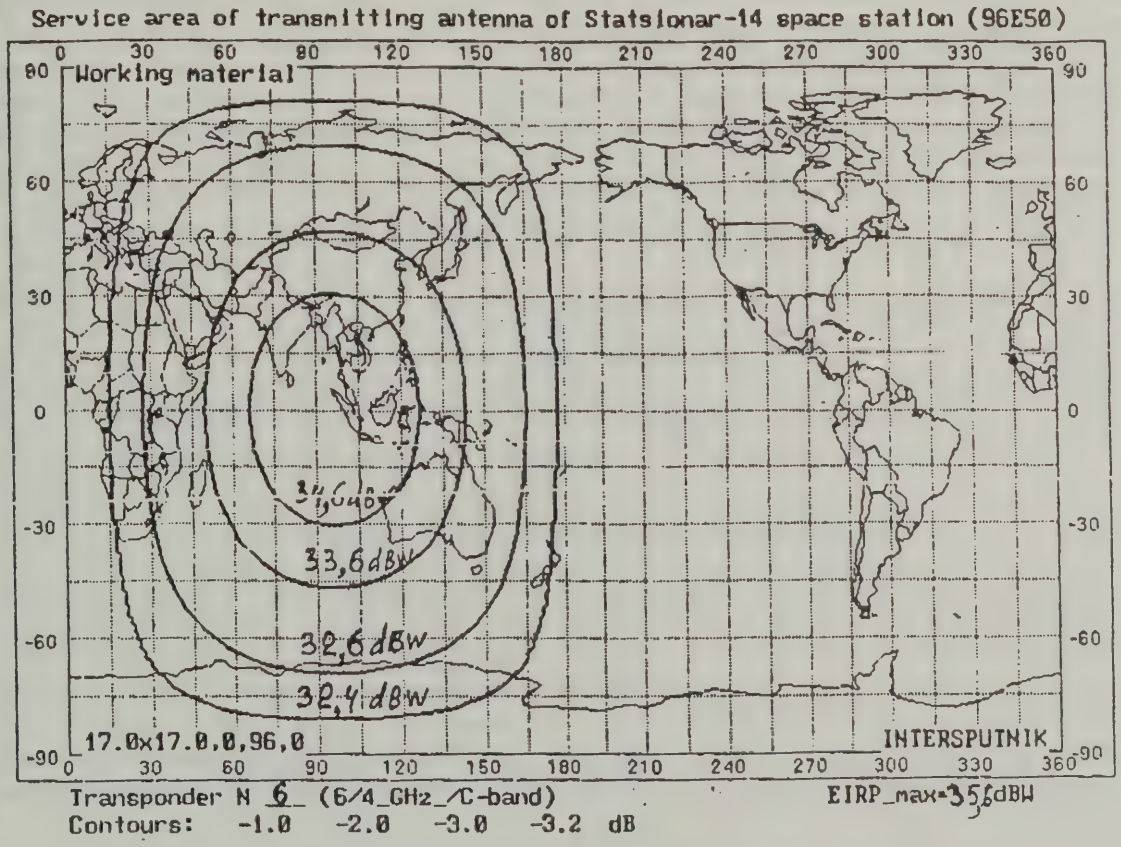
These Russian satellites are equipped with three possible transmit-antenna configurations (although typically only one beam pattern is in use at each satellite):

Global pattern - which looks down at the earth through a 17 by 17 degree window

Hemispheric pattern - with an 8 by 18 degree window

Spot beam pattern - which restricts the coverage zone through a 5 by 5 degree window

According to Borovkov, only Statsionar-14 (96.5 degrees east) is using a global beam pattern and the other three satellites listed have beam windows that favour the northern hemisphere resulting in very little signal being available to New Zealand. On Statsonar-14 television is transmitted on transponders (their numbers) 6 (3675 MHz in Russian), and 9 (3825 MHz in Chinese) from 2100 to 1700 UTC daily (i.e., all but four hours per day). Borovkov calculates that with the 'low look angle' use of a 4.5 metre dish on transponder 6 and 9 metres on transponder 9 would produce *"high quality reception."* We show Intersputnik provided coverage on transponder 6 for Statsionar-14 here.



News Corporation chairman Rupert Murdoch has admitted in interview his decision to pull BBC WSTV from Star satellite package in Asia was intended "*...to improve relations with China.*" Press reports had attributed Murdoch's decision to widespread Chinese complaints following a BBC WSTV screening of a documentary that alleged revered Chinese leader Mao Tse-tung had an "*active sexual interest in young girls.*"

Apstar orbital assignment conflicts were threatening to delay launch by Chinese Long March 3A rocket of Apstar 1 and 2 satellites through mid-June. Apstar has widely promoted its 1 and 2 locations as "131 - 134 east" but there are conflicts. US based RIMSAT (**CTD**: 9405, p.2) has operating satellites at 130 and 134 east, on lease from the Russians. Both satellites have limited frequencies available but some of these frequencies do conflict with proposed Apstar channelling and both satellites direct C band footprints into India and surrounding areas which Apstar is 'claiming' for future coverage. Apstar 1 is, at press time, still 'officially' scheduled for launch during July by Chinese, Apstar 2 in December. The Hughes built (HS-376) Apstar 1 will have a slightly unusual transmission format with 12 vertical., 12 horizontal polarised transponders starting at 3660 MHz (horizontal) and 3680 MHz (vertical).

British Tel is now offering digitally compressed video service across the Atlantic, after testing it within Europe, using Intelsat 601 (27.5 west). BT expects the digital service to reduce transponder rental costs by 60% because of bandwidth savings.

Pace Micro Technologies Ltd., primary UK manufacturer of satellite TV receiving systems, has entered agreement with NTL of UK to develop consumer and professional digital TV reception hardware. Pace receiving systems are design leaders especially in European Videocrypt field while NTL has developed MPEG family encryption/decryption systems including one sold to TVNZ for BBC links to New Zealand.

How many European homes are using 'unauthorised' (pirate) smart cards to access BSkY transmissions? Marketing research firm GfK believes it exceeds 200,000 based upon one measurement technique. They took total number of BSkyB paying customers who have discontinued paying for service as an indication of impact of cards in Europe. BSkyB's latest attempt to outmanoeuvre rampant use of 'unauthorised' cards was to launch a new level of card known as the 'Period 9.' The unauthorised card firms bounced back promptly; one, Megasat of Germany introduced Magictouch card that decodes all BSkyB plus encoded adult, Japanese and Asian language channels. The card is equipped with a tiny button the user pushes to restart descrambling whenever BSkyB attempts to defeat unauthorised cards with a software routine change. Murdoch 'authorised' cards sell for NZ$720 per year for full service while 'unauthorised' cards have a street price as low as NZ$120.

Antipiracy Contact Group (ACP) has been formed with Brussels headquarters to co-ordinate efforts throughout Europe attempting to deal with the increasingly widespread sale of 'pirated satellite TV descrambler authorisation cards.' The group plans to begin the process of educating consumers and legislators by showing the programme creation-transmission-entertainment value cycle that is undermined by the widespread use of non-authorised descrambling cards. They will focus attention on present laws where they exist and encourage enforcement of these laws; Germany is the first 'target' country for this effort. Where present laws do not consider pirate authorisation cards to be illegal, ACP will attempt to educate legislators and courts to the need for revised legislation. Denmark is a focus point for this activity where the Danish Minister of Culture recently told the press, "*Encoded programmes transmitted by satellite are not regulated by S22A* (intellectual property law provisions) *and so-called 'pirate cards' are therefore not illegal here.*" To punctuate the growing economic threat of pirated cards, the latest version Videocrypt II system appears to have been broken (again) with piracy cards appearing first in shops throughout Holland (**CTD**: 9404, p.29; 9405, p.29 - OMI God). Editor's Note: CTD received approximately ten telephone queries concerning 'sourcing' for the European PC friendly Videocrypt-busting routine OMI-GOD following our

BUSINESS OPPORTUNITY FOR SOMEONE

Virtually everyone reading this believes glass envelope tubes (found in electronic equipment) are 'dead;' no longer used in new equipment, only occasionally sought for older equipment. Actually, tubes are still preferred for audio amplifier 'output' stages; a situation where the tube is a superior choice to a 'power-transistor' for sound-purity reasons.

One of the benchmark triode-type tubes, designed and sold by Western Electric, is now back in a newly designed and patented form. VAIC VALVE, an Italian firm, is now marketing its model VV 30B, a 35 watt rated linear output triode (four pin socket) with a written guarantee of 2,000 hours with closely specified harmonic and distortion ratings. This tube is a direct replacement for the original WE version. VAIC VALVE Italia is looking for a distributor in New Zealand and Australia (contact Eunice joy Kron at FAX 00-39-424-524395).

issue 9405 report. Most of these callers displayed an interest in importing this program to New Zealand where SKY Network also uses Videocrypt encoding technology and software. Future callers in this area can save themselves the expense of such calls. IF (and that's a big 'if') a copy of this programme is available in New Zealand, we have no knowledge of its existence. Further, 'IF' we someday should happen to find a copy of this software in our mail, the very last thing we will do is pass it along to those who would intend to use it for unauthorised access to SKY programming here.

UK sale of home satellite dishes continues to be 'down' from 1993 sales numbers and this is causing some concern at BSkyB and with others who have their corporate planning tied to its continued growth. Home dish systems averaged 50,000 units per month through 1993, have fallen to per-month-average of 30,000 units during 1994 to date. In other European venues, sales have continued brisk with French and German consumers running ahead of 1993 sales figures month for month. BSkyB, in attempt to hype sales, has launched a 'one month free trial' marketing programme in co-operation with satellite dish dealers and distributors. Of particular interest: In areas where cable TV is now coming on line, home dish sales are down more than 60% from 1993 figures.

Although US DSS Ku band satellite service is less than 6 weeks old and long ways from selling first 1,000,000 home units, system creator Thomson Consumer Electronics has now turned over design data to second source Sony and says it plans to announced a 'third source' firm within 90 days. Sony had paid to be included in TCE distribution chain and bought right to manufacture DSS receivers from Thomson more than one year ago. The agreement allows Sony to enter the field using TCE technology when the 1,000,000th DSS receiver package is sold. Thomson will be issuing 'third source' licence details before end of this year and Toshiba has stated they are interested, believes Sony will be offering DSS packages 'by 1995.'

Another American DBS operator, EchoStar Communications, has raised NZ$537m to build and launch a pair of Martin-Marietta designed satellites with late 1995 launch date.

Texas Instrument has agreed to incorporate Macrovision anticopy technology into encoder chips sold into equipment designs for reception of satellite and cable programming. The Macrovision system is widely employed to prevent unauthorised copying of rental tapes and initiated New Zealand use this past October (**CTD**: 9309, p.17). Receivers and cable converters equipped with TI built Macrovision feature will find it more difficult to 'tape from satellite / cable' programmes keyed by the coding.

SATCOM C-1 at 137 west (reception has been reported in New Zealand on 7m and larger dishes) has leased 13 of 24 transponders on C-band to TCI owned firm Western Tele-Communications. There has been no announcement as to how the new transponders will be used other than for "cable TV services."

Japan's newest satellite, BS-3N, is intended as time-phased backup for existing BS3A and 3B. It is the 3B satellite that distributes Japan's MUSE analogue HDTV service to an estimated 30,000 Japanese homes.

French 24 hour news service which launched on TF1 June 24 will be compressed digital video by end of year. La Chaine Info has ordered Thomson digital compression equipment and will add three other services (not yet identified) to same transponder in digital format.

-STATUS REPORT / DIGITAL HDTV TESTING-

With the passing of each month, digital high definition television service moves closer to happening. The MPEG-2 world standard nears final approval with no apparent obstacles to prevent adoption by January 1st. US on-air testing at Charlotte, NC enters phase-2 this month moving from Zenith's VSB (vestigial sideband) modulation tests of multipath and field strength parameters to full scale wide area service with cable television system participation. The cable systems will carry the test programming, evaluate operability through cable plants of varying amplifier cascades, and provide mini-test beds for evaluation of prototype consumer receivers and VCRs. These tests will conclude early in 1995 and final adjustments (if required) will be made in the transmission parameters. US commercial HDTV must still go through complicated rechannelling decision phase; a problem shared by the UK where spectrum space for digital telecasting has come down to a pair of undesirable UHFchannels. Best educated estimate of regular operation: latter half of 1996 although Philips, Zenith and other major TV set makers expect 1996-1997 version TV sets and VCRs to 'routinely come with MPEG-2 compatibility.' European Union telecommunication ministers agreed May 30 that European broadcasters should come to their own consensus on dates for switch to digital TV but reserved right to intervene if no consensus is reached. A September deadline has been imposed, and temporarily previous ruling that made analogue D2-MAC the satellite TV industry HDTV standard has been allowed to stand.

Intelsat is considering proposal to establish high power DTH satellites as a part of its global network. Until now, the satellite consortium has stayed out of this field leaving it to Astra, and national satellite services operated by countries such as Japan to establish their own services. Intelsat is considering DTH Ku band service initially for Europe and Central plus South America. Earliest final decision would be in October-November.

DIGITAL TV

NTL, UK firm creating leading edge technology products for digital video encoding, has now shipped more than 100 encoders to customers. Each channel/station using digital format must have at least one such device and where two or more programming channels are digitised and combined for transmission as a 'digital bundle' there is one encoder for each programme channel. Television New Zealand was to have begun receiving BBC1 and BBC2 via Intelsat using NTL digital encoding hardware this past February; service has not begun yet. NTL deliveries to date have been for original MPEG-1 format; they expect to ship MPEG-2 'world standard format' units in last quarter of this year. Latest NTL System 2000 users include United Artists who are combining The Parliamentary Channel, Learning Channel and Wire TV onto single 36 MHz wide Intelsat transponder.

1996 Olympic coverage in widescreen HDTV format, even on very limited basis, will apparently be a non-problem. US media had painted reports of inability of industry to field sufficient HDTV cameras and production vans to make it possible but reality is quite different. In recently completed 1994 Winter Olympics, Japanese and European networks teamed with suppliers to produce 1125 line for Japan's MUSE HDTV system as well as 1250 line for European users. An impressive 112 hours of 1125 line video was satellited to Japan for use on their over-air MUSE system originating from three Japanese O/B vans equipped with 17 HDTV cameras. Equipment shortage in 1996? Not likely.

To fund HDTV in 1996 at Olympics, a group of 20 cable TV firms in US are seeking support and US$5m funding from Pentagon's Advanced Research Projects Agency. They plan to establish satellite and cable links throughout USA fed directly from Atlanta by HDTV feeds Japanese and European broadcasters will create.

Microsoft has announced software programme 'Tiger' which claims to greatly reduce cost of converting existing microprocessor systems to handle interactive TV. The programme was developed with the support of Intel and Compaq and holds the promise of reducing interactive TV hardware costs by more than 50%. Primary beneficiaries of the new technology will be telephone companies and to a lesser extent cable TV operators who will be offering video on demand television to subscriber homes. Tiger will be tested on TCI system in Seattle starting in September.

Toshiba is latest firm to announce availability of single-chip for decoding HDTV digital compressed signals. Some appreciation of the new technology: chip will reproduce 1152 x 1024 images at 30 (25) frames per second, measures 15 x 15mm, uses CMOS structure and contains 1.1 million individual transistors (!). In an HDTV or multimedia environment, chip requires four peripheral 4M DRAMs to decode NTSC/PAL signals with a 70 MHz clock speed.

SPEG: Sony's version of MPEG which it describes as 'broadcaster friendly' and capable of compression ratios as high as 20:1. It is believed Sony will use this as an internal 'architecture' in new professional digital equipment to be released by June 1995.

CONSUMER ELECTRONICS

Ministry of Commerce through Statistics New Zealand is modifying the measurement system for keeping track of consumer electronic equipment imported into New Zealand. When CTD was preparing our 1993 summary of all electronic imports (see **CTD**: 9402, p.2) we found several anomalies in the way colour television receivers are 'counted' at the time of import and brought these to the attention of the Ministry of Commerce. Accordingly, new

AT SATELLITE-CABLE SEMINAR 94 / TUNE IN AT 100.2 MHz

Satellite Cable Seminar 94 at the Angus Inn, Hastings September 14-17 will be 'broadcasting' important co-ordination announcements and some of the seminar sessions 'live' on an FM band frequency of 100.2 MHz. Using a VEXX Digital FM model TMX-500 (300 milliwatt) transmitter, attendees will find a 'homing message' available on their automobile FM radio for distances up to 3km from the Inn. Attendees who carry a pocket FM radio (thoughtfully equipped with an earphone 'plug') can wander the Seminar grounds (touring the satellite antenna lot, for example) and stay 'plugged in' to those sessions which are connected to the VEXX transmitter unit. A really clever person might even find the opportunity to audio-record the transmissions on 100.2 MHz for later review by bringing a suitable tape recording unit. One of the SCS-94 exhibitors is a distributor for the VEXX units.

'statistical keys' have been added to keep track of television direct-view screen sizes larger than 560mm (the previous largest size counted), projection television receivers (as a new category), and combination TV/VCR units (also a new category). In CTD for February we also wrote:

"Our table shows an 'NES category' which we share with you more out of bewilderment than for any specific value. Importers are required to show the screen sizes on all import documents. TV sets that are 'Not For Broadcast' and those not screen size declared end up in the NES category. A TV set 'not intended for broadcast reception' would be a very strange device indeed (Editor's note: Which is exactly as it turned out - see what follows). *In 1988, NES amounted to 0.00068% of all units imported. By 1991 it accounted for 14.37% of all units; in 1993, 24.69%. We have drawn this unexplained trend to the attention of Statistics New Zealand and the Tariff Policy Division of the ministry of Commerce but to date do not have a satisfactory explanation of what this trend is telling us."* Well, perhaps now we have this question answered. **Margaret Evison** for the Secretary of Commerce has advised CTD, *"In answer to your question about increased use of the 'n.e.s.' category, where screen size is not specified, imports under this category include* SKY (network) *decoders, video monitors and closed circuit televisions."* The primary answer to our puzzle, then, after allowing for nominal growth of video monitors and closed circuit television systems is SKY decoders. For the record, using 1990 as a base year we end up with the following number of SKY decoders imported into New Zealand:

a) 1991 - 34,602 units averaging NZ$369.90 each
b) 1992 - 40,725 units averaging NZ$319.56 each
c) 1993 - 61,874 units averaging NZ$266.51 each

Sky as of January 19, 1994 had a reported 125,553 subscriber equivalents and to December 31, 1993 had imported 137,201 SKY 'decoders'. In the future CTD will routinely track SKY decoder imports. 'Real television sets,' those with picture tubes and speakers, are therefore significantly diminished in number for the years 1992-1994 now that we understand all 'N.E.S.' category units should be backed out. We will provide a recalculation of this in our September issue.

GE (stands for General Electric) will be new consumer electronics brand name in New Zealand and Australia according to Thomson Consumer Electronics. Firm produces home electronics including TV receivers, VCRs, camcorders under many brand names throughout world. In other PAL countries in Asia, including India, Indonesia, Thailand, Malaysia, Viet Nam, Hong Kong and Singapore, same sets will bear Thomson brand name. 1995 model receivers are expected to have provision for adding DTH/DSS/DBS satellite service front ends as well as "in / out" jacks for addition of MPEG-2 decoder units. The latest hand held remotes being sold in US already have buttons reserved for DSS receiver operation.

Movies on CD 'players' are positioning themselves 'on the field' for anticipated August announcement from Philips. Although Philips began shipping CD-I movies last spring with its new player (**CTD**: 9309, p.18) there has been less than universal acclaim for quality of early-days MPEG-1 digital compression (**CTD**: 9311, p.28; 9312, p. 27). Primary complaint for those who are willing to accept *"something less than VHS quality for films"* has been limitation that no more than 74 minutes of material can be compressed onto a 5" CD disc (**CTD**: 9402, p. 36). Philips and Sony hold the most important patent rights in this technology and by virtue of being first into the marketplace with hardware / software, Philips has taken a lead position as the 'captain' of the video CD (CD-I) team. Now Philips plans an August announcement of the next generation video CD technology and has encouraged any firm with a technological interest in video CD to be 'on the team.' And ... here they come onto the field! JVC leads the pack with an announcement that it has *"solved the challenge of placing up to 135 minutes of video on a 5" CD."* They claim a new technique using 'variable-bit-rate' technology allowing 6 gigabytes of MPEG-2 (the desirable format) video to be pressed onto a 5" CD disc. Actually, while 6 gigabytes is considered the minimum amount of 'storage' to handle a movie, the JVC system changes the rules. If the movie or material being mastered for video CD is placed on the disc at a continuous rate (speed of data to disc) the requirement is 6 gigabytes. JVC finds that a movie, like most material, has 'slow periods' and 'fast periods'. In a 'slow period', or when the action on the screen from frame to frame crawls along, JVC slows down the bit rate speed, essentially adapting the bit rate to the pace of the movie. When the action speeds up, their 'variable-bit-rate' system increases the bit rate. End result: 6 gigabytes of equivalent data that averages 3 megabytes per second. JVC is presenting their technique to Philips for consideration. Sony's reaction to the JVC announcement: *"We have our own projects and are in discussion with alot of companies ... movies on a 12 centimetre* (5") *disc is the right direction to be going."* Hitachi has taken different approach to packing more information on (digital) video CD. In conventional system, a laser 'lens' is used to create/read the individual 'pits' of information on a disc. The density of the data has been limited by the wavelength of the 'red laser' waves used to

record and extract data from the discs. Hitachi has replaced the laser lens with optical fibres and the definition or size of the data pits is significantly reduced in size by this technique. Hitachi claims a reduction to 10% of present laser created 'information pit' with new technique (CTD: 9311, p.41) resulting in an ability to place 60 minutes of full motion colour video onto a 2.5" (6.35cm) MiniDisc. Before that is available in products, Hitachi has begun shipping new 50 milliwatt 685 nanometre laser in sample quantities (NZ$240 each) to system designers.

Purchasers of video CD-I systems in the UK are being treated to another get-acquainted promotion. By purchasing Philips CD-I and FMV cartridge buyers receive either free colour TV or free software valued at UK150. In US, Philips has reduced price for CD-I kick-off to NZ$524 and FMV cartridge to NZ$437 (**CTD**: 9405, p. 24).

Philips CD-I digital video cartridges which allow full motion video to be played are failing to keep up with consumer demand in the UK.

After video CD, what new technology is waiting in the wings? It could be 'Holographic Recording.' US firm RCA first attempted recording video using laser recorded holograms with a transparent vinyl tape in the 1960s and even brought to market Holotape Selectovision in 1969. This preceded magnetic tape as a consumer technology by more than a decade, and it failed for a variety of technical and software problems. Japan's NTT has revisited holographic technology using end of century technology and skills and claims a break through but in its present form it could be a decade away from products in the street. NTT uses a technique they call 'photochemical hole burning' (PHB) which begins with a crystal structure (base record-on material) that at this point must be cooled to a temperature unlikely to be reached in the average living room; -266 degrees Celsius. Individual (analogue) picture frames are transferred to the crystal structure using fairly standard holographic 'light interference pattern' techniques. NTT claims that a piece of their crystal measuring 10 x 15mm (the size of your smallest fingernail) holds more than 10 million individual images (frames); the equivalent of 100 hours of black and white video or 30 hours of full colour. Once the holograms are 'recorded' to the crystal structure, a laser driven by a computer programme sequences the images at a speed chosen by the operator. The technique is totally unlike magnetic or other existing optical systems and may be more important to long term data storage and retrieval than television although there are no technological barriers to it being used as a television recording mechanism. The ability to store 10 million colour images on a structure the size of your smallest fingernail will certainly have multiple commercial applications in the 21st century.

Sharp is getting jump on competitors with first compressed digital video capable camcorder, available in Japan July 1. Not quite totally CDV, the new ViewCam unit has external modem adapter allowing images to be transmitted through a standard telephone hook-up in three formats: Detailed images in 20 seconds, normal images in 11 seconds, plain images ion 8 seconds. The camera has IC that stores up to ten separate images as 'shot' by ViewCam and each image can be individually called up for transmission or review. At receive end of telephone circuit, modem translates incoming image to TV format picture for display on standard TV set or on monitor of second ViewCam. Modem is priced at NZ$710, ViewCam's designed to work with modem upwards from $2800. Only 5,000 modems are planned per month initially, and there are no present plans to export devices outside of Japan.

US computer manufacturer Packard Bell (number two in overall US market, number one in mass market sales for home users) is taking the shine from Apple's computer-TV set announcement (**CTD**:9312, p.29). Apple introduced model LC520 computer that includes TV reception and CD audio listening capabilities at NZ$3,400. Apple has 10% of US mass-marketed computer field behind Packard Bell (39%) and IBM (19%). PB's latest models do just about everything in one package with pricing starting at NZ$1600 and for complex packages topping out at NZ$4950. Full sized and compact Spectria lines offer TV, FM, (AM) radio, stereo, FAX, CD-ROM, telephone answering and photo CD functions in addition to 'high-powered computing.' In the TV mode, the units can stop on-screen motion, integrate (merge) TV picture frozen in memory into other computer window driven features. The computers are, for home use, near state of the art with 486DX2 and Pentium processing. PB believes the world-wide production of home computers will pass 60 million mark annually by 1997. Current year TV set production is forecast at 98.5 million.

Sony has introduced low priced Hi8 camcorder in Japan with NZ$1250 retail price. Unit has simplified 2 position lens with 3X zoom or wide angle, optical viewfinder. Kyocera is offering the same unit on an OEM basis.

LaserMouse is being demonstrated to US backers. Unit emulates the functions of a desktop mouse but is connected to interactive TV cable or VCR using wireless technology and when user waves the LaserMouse in the air in a prescribed pattern, the mouse moves the cursor around the screen selecting menu and command options; 'SuperMouse' (tm).

Toshiba begins shipment this month of 32"/813mm and 35"/889mm 'flat screen' TVs. To date, Panasonic has dominated this niche of industry. Receivers in US have price range of NZ$2500 to $4100. They will also begin shipping 27"/686mm standard direct view set with built-in 4 head VCR at NZ$1320.

US market concentration by 'top 3' is evident in 1993 study figures. RCA, Magnavox (Philips) and Panasonic captured 29.9% of VCR market while Sony, Panasonic and RCA had 52.2% of camcorder market. Market share breakdown in New Zealand is not known.

Chinese production of TV receivers is in major swing away from black and white to colour. One year ago, majority of all TV sets manufactured (for internal sale or export) were black and white. In first four months of 1994, colour sets accounted for 55% of total (5.19 million out of 9.44 million) with black and white 45% (4.25 million).

Panasonic is marketing 3DO game system with newly released Jurassic Park game in US by offering buyers delayed payment terms: After nominal (10%) down payment, no additional payment for six months, no interest on unpaid balance. Panasonic sold 30,000 of the players in first six-months of US exposure at NZ$1150 each, then cut price to NZ$825. Their sales target for 1994 is 300,000 sold units in US. Full motion video (FMV) cartridge will go on sale in US around August 1st at NZ$415 list price. The bad news for 3DO is that early licensee AT&T has decided not to offer 3DO packages to US consumers in 1995. AT&T had originally planned to offer three models of 3DO (**CTD**: 9402, p.13) having purchased marketing rights in mid-1993. AT&T will launch Sega Genesis Edge 16 peripheral to telephone customers through AT&T 'shoppes' and by direct marketing nation-wide in lieu of 3DO. The Sega package allows telephone customers to interconnect so two widely separated customers may play games while simultaneously talking with one another.

Panasonic will be 'only video sponsor of 1996 Olympic Games' and will also supply video production equipment to games. Sony had previously signed with Goodwill Games (July 23-August 7 in St. Petersburg, Russia) as sponsor. The Good Will games will be extensively telecast world-wide with 64 hours on Turner Broadcasting 17 hours on US ABC network in states.

Sony is marking 15th anniversary of Walkman introduction by offering 2 new commemorative models which go on sale in Japan late in July, elsewhere in approximately October. A 'chrome-plated collector's edition' will have a street price of NZ$375, a replica model NZ$350.

Atari reports 'start up problems associated with introduction of Jaguar game system' caused a 19.6% drop in net sales for quarter ending March 31. Jaguar, like other new gaming systems suffers in marketplace from very limited software programmes available. Atari expects to release up to 6 titles shortly, hopes for total of 30-50 by end of year. In other announcement, Atari has signed exclusive deal with Sigma Designs who will offer Jaguar on an IBM plug-in card using MPEG technology. Atari itself plans to ship CD-ROM drive for Jaguar by September, MPEG 'cartridge' by Christmas.

Nintendo Entertainment Systems has been found guilty of infringing on two 1977 (US) Alpex Computer patents by using "bit mapping structure" technique in displaying video game images. Nintendo admitted it used the system for early videogames but claimed to the court it abandoned the technique except in some of its coin operated games. Records indicate Nintendo had US$6.7B in US sales from 1985 onward; damages are yet to be determined. Alpex is asking for US$200m in damages, US$3.6B in patent royalties. Alpex had previously signed patent dispute agreements with Magnavox (1982) and Atari (1983).

-STATUS REPORT / DIGITAL AUDIO BROADCASTING-

Digital audio broadcasting (DAB) technology has matured to the point of standards but implementation of the technique in the real world has broken into two camps. The US is insisting on following IBOC (in-band, on channel) and IBAC (in band, adjacent channel) planning which would squeeze DAB into existing AM and FM broadcasting allocations. The rest of the world is in favour of creating new frequency bands for DAB; the UK is testing services in London in the 226 MHz range, Holland in the 189 MHz range. The US Voice of America has tested L band (1.6 GHz) DAB from satellites, Australia has tested 1.4 GHz terrestrial service (**CTD**:9404, p.39). The non-IBOC/IBAC group favours the Eureka 147 technique which is scheduled for ITU formal approval before the end of this year. The American insistence on IBOC/IBAC is in response to political pressures from existing terrestrial broadcasters who view DAB as a 'technical improvement to existing broadcasting services' and who do not favour a new system with new frequencies which would signal the start of competitive broadcasting 'outside of the existing broadcasting industry.'

16:9 wide screen colour monitors have found market corner in advance of wide spread use in homes. Amsterdam's Schipol Airport has installed 1,200 of the Philips monitors (26/30/36" diagonal size) and plans 2,000 more by end of the year; Singapore, Brussels and Frankfurt airports are next in line.

Blank VHS recording tape costs coming down? Retail price drops in past 12 months have roots in drops at OEM level. Study of 1993 recording tape shipments reveals 395,913,000 VHS 'consumer blanks' were produced in year with average price at OEM of US$1.85 (against US$2.12 in 1992). VHS-C dropped to US$3.12, 8mm dropped to US$3.82. In high speed duplicating area, T-120 or equivalent VHS 'pancakes' fell to US$0.89 each from US$1.08 in 1992.

CABLE/FIBRE TV

Kiwi Cable's Tony Goodman has expressed his concern that "*other would-be cable entrepreneurs may mess up the copyright issue.*" Goodman cited PacSat's John Rutherford whom he said "*Could be dangerous if he gets a large enough satellite antenna functioning at Greymouth to import programming for which no copyright clearance has been obtained.*" Rutherford has been quoted in South Island newspapers as promising satellite delivered television programming from a wide variety of sources including the BBC and a pair of Australian channels. "*If he* (Rutherford) *actually gets those signals and begins distributing them into Greymouth, there could be an adverse ruling concerning cable TV which should be avoided at this time.*" Goodman feels Kiwi Cable's test-case, brought before the Copyright Tribunal within the Department of Justice, is the "*proper venue*" to clarify the many unanswered questions raised by cable within the framework of the 1962 (New Zealand) Copyright Law. The Copyright Tribunal desk within Justice was first scheduled to meet on procedural matters relating to the Kiwi Cable (vs.. SKY Network) case on May 16; a date postponed until "*sometime in June*" on May 14. (**CTD**:9405, p.25) Late in June, CTD was told by Robert Wesney at (Justice) Tribunals Division "*The preliminary hearing is* (now) *likely to be held in early August.* (At that hearing) *the question of the Tribunal's jurisdiction to consider the Kiwi Cable application will be considered.*" Meanwhile in Greymouth, PacSat activity during June was equally equally quiet; the cable system remains non-functional as a commercial operation.

Kiwi Cable has been testing Ku band reception at their Paraparaumu location using the giant 16m ex-Western Union (Wisconsin, USA) dish installed at their site. Boresighted on Optus B1, the big dish has been producing 'studio quality' pictures from a variety of Australian domestic TV network services including channel 9, ABC and SBS. However, there are no immediate plans to add Australian services to their cable service although Kiwi Cable's Mark Marfel is designing a mould for a new 12m fibreglass dish which he plans to use on Ku band in the future. Construction start on the firm's announced fibre optic expansion (**CTD**: 9405, p.25) is not yet underway with some negotiations apparently still ongoing for the routing of the fibre optic cable towards Wanganui. One possibility - the fibre optic line will be run along NZ Rail tracks.

SKY TV's John Fellet presentation before National Cable Television Association (NCTA) annual convention in New Orleans late in May characterised the SKY approach to pay TV delivery as "*the electronic equivalent of a pontoon bridge.*" Fellet explained to the world's cable TV operators how use of New Zealand UHF frequencies has bypassed traditional cable transmission techniques, allowing the firm to reach concentrated population regions without sacrificing rural coverage in adjacent areas. Fellett's (American) background includes several decades of cable TV system management before he came to New Zealand to oversee SKY service.

NCTA show saw 125 (someone actually counted them!) new cable TV programming services on offer. The majority of the newly proposed channels will await introduction of compressed digital video satellite transmission facilities and availability at cable headends of CDV decoders / analogue transcoders before starting operation. Largest categories: Foreign (to US) language programming for ethic groups, largely to be imported into the US via satellite from countries such as Egypt, Romania, India.

Continental Cablevision, Inc., presently third largest US cable company (2.93m US homes served), is latest North American firm to join Australia's swing to cable delivered programming. Optus Communications, originally a satellite delivery later generation of original Aussat, has signed joint venture agreement with Continental to "*explore the provision of a wide range of advanced broadband communications and interactive entertainment and information services to Australian consumers.*" Although detailed plans have not been announced, the press release suggests Optus and Continental will offer Opus (satellite) interconnected services with Continental bringing its expertise in fibre optic and coaxial cable technology to the party. The emphasis will be on cable delivery of subscription television programming. Continental has also announced joining of consortium to build new Singapore cable TV system which also has Singapore Broadcasting Corporation and Singapore Telecom as partners. Optus

has also signed a ten year agreement to provide direct to home satellite services for Australis Media and Continental Century and claims the DTH services will launch this September. Australian reports suggest the Optus relayed programming will be available to both new MDS licensees (owned by Australis and Continental Century) and individual homes outside of MDS areas using DTH. The exact Optus transponders to be used, whether the programming will reach into New Zealand, remains to be sorted out.

Australis Media Ltd, recently partnering with US cable giant TCI to bring American cable programming into Australia (**CTD**: 9405,p. 27) has apparently changed its source for cable TV set-top converter units. Original order, with European Tanberg, was for 10,000 units equipped for NICAM stereo audio and Cryptovision descramblers. Australian sources say this order has been cancelled and Australis will now use American General Instruments set-top units which have neither NICAM nor Cryptovision capabilities.

British Telcom interactive test system is in and functional at first 70 homes (Kesgrave, Suffolk). Trial homes are copper-wire connected through ADSL 'modems' capable of through-putting up to 6Mbits/sec using discrete multi-tone modulation format (DMT). BT has stated they view ADSL format interactive TV as "interim format" that will, at best, bridge gap to fibre-optic lines to each home. BT also is developing a 2,500 home test of video-on-demand service for homes in Colchester, Essex which it had hoped to launch later this year. Presently the British government enforces a ban on BT carrying "entertainment programming" by any means and a May formal request from BT to offer VOD was again turned down. BT's response was that by not being allowed to 'test' VOD, they could not properly design and upgrade their network for "superhighway broadband technology."

Sega's cable TV delivered 'game delivery channel' now being tested on US and Japanese cable TV systems is being priced at NZ$25 per month. Subscribers receive cartridge adapter for Sega video games machine (which interfaces to cable TV system) and unlimited play of games offered 'on demand' for the fee. Typically, market price of Sega game cartridge is NZ$90 in USA.

UK cable TV relays, direct to homes beyond cable lines or between facilities, using 40 GHz band are planned by ITC. The first such installations are scheduled for the west Kent area.

Video Dial Tone, the name given to the system that allows telephone companies to combine fibre optic distribution with old-fashioned copper wire technology to bring limited access live television programming to a (telephone) subscriber's home, is stalled at the gates of the FCC in the US. Telephone companies do not have an 'automatic right' to provide combination telephone and video services (as Telecom does in New Zealand) and must make application for such approvals with the regulatory agency; the FCC. At this point in time, while the FCC has approved the 'principal' of Video Dial Tone (or television via a telephone line), it has been very slow to approve specific systems. This has encouraged a number of regional telephone companies to apply for 'test authority' to engage in various types of 'marketing and technical experiments' with Video Dial Tone (VDT) as a stepping stone to full scale implementation of the service. The FCC is normally more comfortable authorising 'tests' than full scale implementation of a (any) new technology. But the 'size' of the tests has now become a serious concern to the FCC. Recent test approvals have been for relatively small areas, all fewer than 1,000 homes. But pending at the FCC are numerous applications for sizeable tests including: Bell Atlantic (25% owner of Telecom NZ) with 3 applications to 'test' with a total of 350,000 (US) homes; Ameritech (25% owner of Telecom NZ) with 5 applications to 'test' with 1,256,000 (US) homes; Pacific Telesis with 4 applications to 'test' with 1,300,000 (US) homes, and, US West with 5 applications to 'test' with 974,000 (US) homes. Each of these firms (and others including New England Bell) have released reams of press agentry touting their fibre optic network expansions and Video Dial Tone 'testing' but to date the US Federal Communications Commission has not given test approval to any of these large test systems. In seeking approval for VDT New Zealand Telecom investor Ameritech revealed it plans to spend NZ$660m installing service in five (US) state area, projects 9% of homes will 'subscribe' in first year rising to 39% by 10th year. Firm projects system would break even (including earning back previous year losses) in 8th year. Ameritech says fibre optic based system would set aside 70 analogue programming channels (420 MHz bandwidth) plus another 180 MHz bandwidth for digital transmissions. All of this is instructive as to the direction Telecom New Zealand may travel as it reaches end of 'test phase' with Pakuranga and New Lynn fibre optic / cable trials (**CTD:** 9309, p.2). Bell Atlantic, second US investor in Telecom New Zealand, plans to spend NZ$18.2B by 2000 to bring interactive multimedia fibre optic based service to an estimated 8 million homes. Calling its new service BAnet, the firm is scheduling fibre optic conversions in Baltimore, northern New Jersey and Philadelphia initially. A host digital terminal (HDT) will be installed at each system centre with fibre optic to neighbourhood nodes. General Instruments (represented in New Zealand by Maser Technology Group) will supply the encryption and digital compression, end-to-end access control and digital to analogue addressable set-top converter units.

Electric utility firms, who have installed significant amounts of fibre optics in some portions of New Zealand and who could if they wished offer their 'spare f/o capacity' to anyone with the dollars to pay for its use, are making a run in the US to be alternate providers of 'Information Superhighway' backbone network. Electric utility companies there, also, now routinely install fibre optic circuits on cross country lines and use a small portion (less than 10%) of the f/o line capacity for their own signalling and monitoring needs.

American cable giant TCI is enlarging Japanese operations by forming joint venture with Japan's largest cable TV operator; Sumitomo. Both will contribute NZ$825m to expanding existing Sumitomo cable operations which will include first direct telephone competition to Nippon Telegraph & Telephone system.

Indian government is attempting to force regulations on essentially free-running cable TV industry that claims to have more than 7 million homes connected to an estimated 50,000 separate headends. Legislation scheduled for Parliament debate this month will force systems to follow 'content' regulations, banning soft or full porno programming, require cable carriage of a minimum of one (government operated) Doordarshan channel and require cable operators to 'tape, censor and delay' any programming that might cross the legislated standards border.

US legislation (bill HR-4239) dangles financial assistance carrot to nations willing to upgrade their intellectual rights laws. The bill sets legal framework to allow US government to help nations fund upgrading of their telecommunication and broadcasting systems provided new laws are adopted to enforce US held intellectual (programming) (copy) rights. Bill also ties agreement by nations to adopt US intellectual property rights legislation to granting of future aid in wide variety of areas or allowing a nation to participate in free trade agreements with US. American effort to attach intellectual rights language to GATT agreements last November-December (**CTD**: 9401, p.33) failed under intense French opposition. HR-4239 appears headed for adoption this year but perhaps not in present form. Programme piracy 'watchdog,' the Motion Picture Association of America (MPAA), has been especially active in Congress to identify nations which it considers 'encourages video piracy.' In 1991, MPAA asked US government to withdraw special 'trading rights' accorded to Guatemala based upon charges that Guatemala cable systems were 'stealing more than 40 channels of programming' from US sources via satellite feeds. In 1992 Guatemala adopted legislation which forced cable firms to become licensees of US programmers and early in 1994 the MPAA withdrew its charges against Guatemala claiming "*...most of the illegal uses of US programming has ceased.*"

Hewlett Packard is latest firm to be licensed by General Instrument to build GI's DigiCipher II CDV system for cable converters. HP announced orders for 600,000 of the new units.

TERRESTRIAL BROADCASTING

SKY Network's Dunedin transmitters, operating with a 1 kilowatt (eirp) test unit since late in May, were very much dependent upon 'the weather' atop Mt. Cargill to complete by the original scheduled June 19th turn-on date. Antenna riggers required a maximum of 5 knot winds atop the 680 metre site to complete installation of the new transmission antennas. Historically, they could expect 3 days of under 5 knots during the month of June. The exposed location frequently has winds in excess of 40 knots when the weather in Dunedin is barely breezy.

Wanganui is next SKY community scheduled for service but there are complications. Approximately 50% of the community (those portions at locations above the Wangonui River basin) are receiving 'fortuitous reception' from the recently installed Palmerston North transmitters (Wharite transmission site) causing SKY execs to ponder whether they really want to install a new set of transmitters for Wanganui. The lower areas of the community could also be served with an MDS (2.3 GHz) system. "*We have been wanting to trial an MDS approach and this could be the place to do it*" notes John Fellett. SKY purchased 2.3 GHz Management Rights for a single channel (2,332-2,340 MHz) in 1990 and would need to buy or lease at least two others from other rights holders to trial such a system. Telecom New Zealand is the largest single holder of 2.3 rights owning 8 of the 12 available channels. There could be modest 'pressure' on SKY to sort this out since would-be-competitor Kiwi Cable has announced Wanganui as a 'target community' for 1994-1995 expansion of its promised fibre optic network (**CTD**: 9405, p.25).

SKY is exploring 'extended service' allowing private firms to carry their service into regions where SKY does not plan their own transmitters in the foreseeable future. One case in point: A private company is picking up SKY Wellington transmissions near Picton and then carrying it via two hops of privately installed microwave to (pub) customers in the Nelson area. The microwave equipment is alleged to have come from surplused military hardware. SKY's John Fellett says he is open to similar business plans from others in areas where SKY service is not directly available, but, rules out "*for the time being*" cable TV firms carrying their programming "*pending resolution of the Kiwi Cable case before the Copyright Tribunal.*"

TV3 expansion plans (**CTD:** 9405, p.28-29) with announced locations and time schedules (**CTD**: 9405, p.20, 22, 24) has attracted flurry of local newspaper reports, perhaps not all accurate. June 2nd front-page story in Northland Age (Kaitaia) told its 7,500 readers "*The news some weeks ago that TV3 is to expand its coverage in Northland in November this year has proven to be something of a generalisation, and inaccurate as far as the Far North is concerned.*" Paper went on to quote NZOA staffer Jan Wano who advised Far Northland region transmitter on (Mt.) Maungataniwha "*will not be installed until November 1995.*" Original schedule released by TV3 listed the site for November 1994 turn-on with translators located at Mangonui and Ahipara to follow in December this year. Chris Prowse of NZOA advises CTD "*TV3 told me, on query, the original schedule holds*" and Phil Johnston of TV3 consulting firm JDA Associates insisted the newspaper report quoting the NZOA staffer "*is inaccurate.*" Johnston further explains that "*The Far North region is the most difficult in the entire country as far as spectrum clearances are concerned. We are in negotiation with TVNZ to arrange the shuffling of channels to make room for the new TV3 primary and translator channels there.*" Johnston does not expect to release actual channel numbers (and polarisation) "*for several months yet*" pending completion of his negotiation with present channel users who must agree to being moved to new channels. "*When we release the channel numbers, it will be by region or area, not for the entire country at one time.*" Service for the northern region will go from the existing Horokaka site via microwave to a new primary transmitter at Hikurangi and this new transmitter will in turn be picked up off-air at Maungataniwha for rebroadcast directly to homes as well as to feed new translators at Ahipara and Mangonui. The Horokaka-north link has been a special engineering problem because of a TV3 transmitter at Ruru (east of Hamilton) which has such extensive coverage that it interferes with direct off-air reception of Horokaka at Hikurangi and points north. Using a microwave link from Horokaka to Hikurangi gets around this problem, but at a monthly microwave link cost to TV3. CTD has learned that Hikurangi's new TV3 transmitter (scheduled October 1994) will operate on channel 10 horizontal (TV1 and 2 are channels 1 and 3 horizontal); Maungataniwha (November 1994) will be channel 4 vertical (TV1 and 2 are 6 and 8 vertical). See separate report page 11 in this issue.

Television New Zealand: How advanced is their planning to place roadblocks in front of the emergence of cable television and DTH (direct to home) satellites? As reported in CTD January (9401: p. 3) TVNZ CEO **Brent Harman** while addressing the Asia-Pacific Broadcasting Union said: "S*tate control of television is doomed to fail. The window to the world via satellite television is now open, and I think it will be impossible to close. Information which in the past has been the prerogative of the political elite has become available to everybody with access to a television set and a satellite dish.*" His statements were characterised as a 'wake-up call' to the realities of satellite distribution. On page 4 of "New Zealand and the International Television Industry" (a 1990 in-house study prepared by the TVNZ Planning Department) the authors have summarised the nearly 100 page document by noting: "*Deregulation has become the norm in the telecommunications industry, including television, throughout the western world. Satellites and fibre optic cables will lead to a vast increase in the number of available channels. By the mid to late 1990s, New Zealand will have around 15* (available to homes) *channels. They will be a combination of national networks and regional channels. Most will be subscriber based. There will be more telecommunications products - cable delivery, satellite delivery, pay per service* (i.e., multiple channels), *pay per channel, pay per view, inter-active video* (banking, shopping, etc.). *Telecommunications and computing are rapidly converging . If established broadcasters do not develop strategies for the* (above) *developments, they run the risk of being marginalised.*" How might TVNZ position itself so as to not be 'marginalised?' Broadcasting & Cable Magazine (The Newsweekly of Television and Radio) provides a clue in its April 25 report covering the annual MIP TV '94 programme buyers show. It reports: "*More strategic alliances surfaced between players from around the world, with Nine Network of Australia, Television New Zealand and Canada's Baton Broadcasting announcing the most unusual: a multinational alliance of terrestrial broadcasters to combat the growing threat from cable and satellite. Bruce Gyngell, Nine Networks chairman, described it as a means to provide 'mutual support,' with the Canadian broadcasters, having already experienced increased competition created by new means of distribution, in a position to advise the others. Although Gyngell didn't explain how the alliance would operate, a source from one of the three companies said that by joining forces they should be better able to secure a better deal when acquiring program rights. If the tactics prove successful, it could setoff a trend of distributors increasingly squeezed by multiterritory buyers. Even if it doesn't work, it illustrates that television companies are increasingly 'thinking global, acting local'.*" At the 'local' level Australia's Channel 9 has positioned itself to be a major player in the recently announced launching of traditional cable TV in that country (**CTD**: 9404, p. 20) while in New Zealand TVNZ is widely believed to be readying its own 'package of programming to be distributed on PanAmSat PAS-2 (see this issue, page 27). What Channel 9 and TVNZ seemed to have already learned from their Canadian partner is that

to 'avoid being marginalised, become a player in the new technologies and don't try to fight them with traditional 'stick a transmitter on a hill' technology.'

CanWest TV3 investor/operator has acquired 50% of La Red TV Network headquartered in Santiago, Chile.

Regional television stations announced by Horizons Pacific Television Limited and TVNZ are placing serious overload on supplier abilities to cope. HPTV's four transmitters (Auckland, Hamilton, Wellington and Dunedin) are in addition to 61 transmission expansion sites for TV3 (**CTD**: 9405, p. 28), and ongoing new transmission sites for SKY Network (**CTD**: 9402, p.42 and this issue). All three projects are also requiring considerable expansions of BCL microwave 'plant miles' as well. BCL has been hiring back previously redundant employees on a specific-job basis and the studio and control room systems for each of the HPTV installations will apparently be done largely by outside contractors.

VEXX Digital FM Ltd has new address and contact number, and new products. Firm pioneered unlicensed 300 milliwatt FM 'narrowcasting' with automated solid-state self-repeating audio message in September (**CTD**: 9309, p.23; 9311, p.33; 9312, p.36; 9402, p.41). Firm manager Jay Mather says *"Concept for uses of these inexpensive broadcasting stations is expanding as more and more people create novel uses."* Amongst most recent: Waikato Real Estate has a pair of Mather's Model TMX-500 units in use on 88.6 MHz to educate consumers in Hamilton area concerning recently listed properties; they have ordered 50 of the lower power TMX-250 units for use at specific homes listed by the firm (interested parties stop in front of house, tune their FM radios to 88.6 MHz and listen to description of the house while in their car); Anchor Foods used a TMX-500 unit during the Agricultural Field Days in Hamilton to pass along displays information to Fair attendees; a TMX-500 installed at Pakuranga College acts as an 'electronic clock' announcing the current, correct time between school administration announcements to students who tune-in the service on their pocket-carried FM radios. Mather's firm is now renting out TMX-500 units for events (such as the Agricultural Field Days, sporting events). A new version of the TMX-500 uses a field-exchangeable "Smart Card" which users pre-record messages on. A new non-New Zealand approved (at this time) low-cost FM band transmitter could be a serious seller: complete 30 watt FM band transmitter (field programmable from 88.1 to 100 (+) MHz in 50 kilohertz steps) for the quite incredible price of NZ$1,500 (not a typo, no missing 'zeros'). The unit measures just 200mm x 160mm x 65mm and operates from a 12vdc (5 amp) power supply. VEXX's new address is 18 Spencer Road, Browns Bay, Auckland (phone/FAX 09-478-4905). Be advised: Mather is out of New Zealand from July 4 to July 26. NOTE: SCS-94 will also be using a VEXX TMX-500 transmitter during our seminar; see separate announcement here.

Terrestrial TV antenna requirements for TV3 expansion may be most significant 'fall out' from the announced plan. As noted in this issue (page 11), the number of new consumer TV antennas, especially for channel 1 (Band I) region, will amount to several million dollars at retail; could double that number when final channelling plans for TV3 are announced. This is sending ripples through New Zealand antenna manufacturing and distribution industries with at least one potential 'merger' suggested between existing North and South Island suppliers. North Island based suppliers AIMCO and Hills Industries are closely studying the new antenna demands in South Island with an eye towards expanding their own distribution there. Trans-Cook Straight shipping costs have been a prime factor in keeping North and South Island suppliers 'separate' up to this point.

Philips developed TV screen ghost (multiple images) elimination system is being considered by Federation of Australian Commercial Television Stations (FACTS). Philips Ghost Cancellation Reference (GCR) signal is special pulse included in the vertical blanking interval (VBI) with equipment licensed by Philips (Tektronix and Leitch presently offer this equipment). The cost to a TV station (network in New Zealand) for the special pulse generator is under NZ$6,000. In the home, a TV set or VCR equipped with a Philips GCR decoder chip eliminates any ghost images by detecting and eliminating trailing or leading weaker images present. Philips is now marketing the GCR equipped receivers in North America under their own label and Magnavox. Set-top tuners with the GCR built-in, as add-ons to homes with non-Philips/Magnavox GCR equipped receivers, are also being sold at NZ$250. By June 1st, 13% of all US TV stations had installed the GCR encoders and the percentage is forecast to pass 50% by this time in 1995. CTD queried Television New Zealand Controller of Engineering **Neville Lane** concerning TVNZ adopting the GCR system last October. His answer said:

"I am aware of several proposals for ghost cancellation systems, originating in the United Kingdom, Japan and Korea. No doubt there are others. However, there is not yet an adoption of a standard system and it would be unwise to take up a technology prematurely simply because it happens to be available. It would be preferable for a single world-wide system to be adopted which would allow manufacturing economies of scale to benefit broadcasters and viewers. (As you have suggested), it would be a relatively minor addition to the transmission

system but whether the system could be installed at low cost in existing receivers is not known. Certainly all new receivers produced after the adoption of a standard system should have the technology included, or be available as an optional extra. In my view, ghost cancellation is the single most important technology that could be adopted by New Zealand broadcasters at an appropriate time." This could be that appropriate time; the International Telecommunications Union has now recommended the Philips GCR system be used by PAL format countries throughout the world.

Egmont Electricity customers are requesting a TVNZ television programme known for its 'investigative journalism' to check into their complaints the power company is not responsive to repeated complaints concerning power line interference to their television reception. The power company reportedly has told unhappy TV viewers in the Pungarehu region they are unable to repair power lines which they admit are the cause of television and FM radio interference, and, an inspector from the RFS/ROG division of Ministry of Commerce has investigated the complaints and decided there are so many 'power leaks' the power company cannot afford to repair them all (**CTD**: 9312; p.37). The Taranaki area viewers are now seeking help from the TV programme and hope that by spotlighting the problem the power company will be forced to repair the damaged lines.

Channel 1 television interference from Australian channel 0 transmitters was unexpected serious problem during June according to monitors recording same at Greymouth, New Plymouth and near Kaitaia. Interference was recorded each day between June 01 and June 26 with the exception of June 2 and 8. Channel 0 signals reached levels greater than those normally expected from New Zealand channel 1 10 kilowatt transmitters at a distance of 30km between 3:25 and 5:50PM on June 10, 2:51 and 5:30PM on the 13th, 1:49 and 7:21PM on the 22nd and 1:44 and 4:05 PM on the 24th. The interference was significant enough to seriously degrade (or cover up) New Zealand channel 1 signals an average of 2.7 hours per day (64.8 hours total in June) in the most recent measured period, or 34.55% of the time period 1:30PM to 7PM for the full month. This is normally a December-February problem on the west coasts of both islands, and in the Far North. However, the phenomenon has an inverse relationship to the 11 year solar sunspot cycle and will increase in frequency and intensity through at least 1998. TV3 take note.

Digital Audio Broadcasting is being trialled in the Netherlands using a modified band III TV transmitter in the 189 MHz range; 1 kW power at Haarlem with a 40 watt translator at Hilversum.

Irish civil objections to use of 2.5 GHz range (MMDS) TV transmitters are complicating expansion of new Telefis na Gaeilge TV service. Irish protesters have created delays for expansion of 2.6 GHz range services for several years claiming the microwave TV transmitters radiate sufficient signal levels to those living near transmitter sites to be a health hazard.

Australian authorities are allowing low power (10 watts and under) FM licensees in the 87-88 MHz region to assume a more competitive role in the broadcasting industry. 'Mood FM' operating on 87.6 MHz in portions of Sydney is now broadcasting background music 24 hours a day and plans to expand coverage with three additional transmitter locations.

-APRIL 1994/YEAR TO DATE CONSUMER ELECTRONIC IMPORTS-

For April imports, CD pricing shot upwards 24.8% from year to date (YTD) average through end of March. Camcorders dropped 24.4% at the same time for the lowest VFD (value for duty) average in history of product into New Zealand. VCRs were up in cost (4.5% for YTD average through March); colour TVs reached their lowest average cost per unit for the year. SKY decoders is a new extrapolated category based upon NES listings (page 41, here). * indicates revised calculation will appear in September 16th edition of CTD.

	APRIL IMPORTS	MARCH IMPORTS	YEAR TO DATE	1994 AVG. COST	1993 AVG. COST	APRIL AVG $$
CD Players	3,245	3,788	11,580	$273.58	$261.63	$319.30
VCRs	6,745	8,766	28,787	$449.35	$478.82	$464.77
Camcorders	1,474	2,136	6,647	$1186.45	$1224.96	$997.11
Colour TVs	14,518	17,287	56,901	$503.51	*	$431.44
SKY Decoder	8,289	8,495	29,607	$251.83	*	$256.59

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NOTE: Next issue of CTD dated September 16, 1994